

TOSHIBA

FILE NO. 810-200710GR

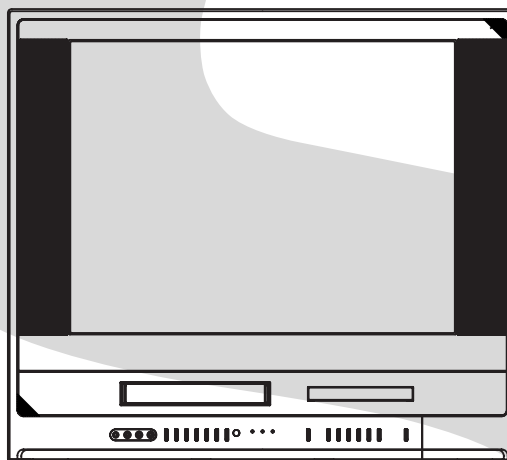
REVISED: 01

SERVICE MANUAL



COMBINATION FLAT COLOR TELEVISION AND VIDEO CASSETTE RECORDER/ DVD VIDEO PLAYER

MW24H63



The above model is classified as a green product (*1), as indicated by the underlined serial number. This Service Manual describes replacement parts for the green product. When repairing this green product, use the part(s) described in this manual and lead-free solder (*2).

For (*1) and (*2), see the next page.

©2007 Toshiba Corporation

DOCUMENT CREATED IN JAPAN, March, 2007 GREEN

(*1)

GREEN PRODUCT PROCUREMENT

The EC is actively promoting the WEEE & RoHS Directives that define standards for recycling and reuse of Waste Electrical and Electronic Equipment and for the Restriction of the use of certain Hazardous Substances. From July 1, 2006, the RoHS Directive will prohibit any marketing of new products containing the restricted substances.

Increasing attention is given to issues related to the global environmental. Toshiba Corporation recognizes environmental protection as a key management tasks, and is doing its utmost to enhance and improve the quality and scope of its environmental activities. In line with this, Toshiba proactively promotes Green Procurement, and seeks to purchase and use products, parts and materials that have low environmental impacts.

Green procurement of parts is not only confined to manufacture. The same green parts used in manufacture must also be used as replacement parts.

(*2)

LEAD-FREE SOLDER

This product is manufactured using lead-free solder as a part of a movement within the consumer products industry at large to be environmentally responsible. Lead-free solder must be used in the servicing and repair of this product.

WARNING

This product is manufactured using lead free solder.

DO NOT USE LEAD BASED SOLDER TO REPAIR THIS PRODUCT !

The melting temperature of lead-free solder is higher than that of leaded solder by 86°F to 104°F (30°C to 40°C). Use of a soldering iron designed for lead-based solders to repair product made with lead-free solder may result in damage to the component and or PCB being soldered. Great care should be made to ensure high-quality soldering when servicing this product — especially when soldering large components, through-hole pins, and on PCBs — as the level of heat required to melt lead-free solder is high.

TOSHIBA

TOSHIBA AMERICA CONSUMER PRODUCTS, L.L.C.

ColorStream, FST Pure and StableSound are registered trademarks of Toshiba America Consumer Products, L.L.C.



Printed in Thailand

TOSHIBA



COMBINATION FLAT COLOR TELEVISION AND VIDEO CASSETTE RECORDER / DVD VIDEO PLAYER

MW20H63
MW24H63
MW27H63

OWNER'S MANUAL

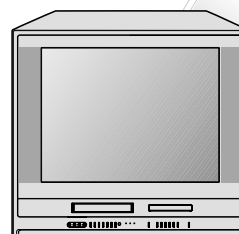


Illustration of MW20H63

©2007 Toshiba Corporation
This device does not tape-record copy protected DVD video discs.

Introduction	2
Connections	13
Basic setup	18
TV operation	23
Playback (VCR)	40
Recording (VCR)	45
Other functions (VCR)	49
Basic playback (DVD)	51
Advanced playback (DVD)	54
Function setup (DVD)	56
Others	72

Owner's Record
The model number and serial number are on the back of your TV. Record these numbers in the spaces below. Refer to these numbers whenever you communicate with your Toshiba dealer about this TV.
Model number: _____
Serial number: _____

Introduction

Dear Customer,

Thank you for purchasing this Toshiba TV. This manual will help you use many exciting features of your new TV. Before operating the TV, please read this manual completely, and keep it nearby for future reference.

Safety Precautions

WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lightning symbol in the triangle tells you that the voltage inside this product may be strong enough to cause an electric shock. DO NOT TRY TO SERVICE THIS PRODUCT YOURSELF.



The exclamation mark in the triangle tells you that important operating and maintenance instructions follow this symbol.

CAUTION: To reduce the risk of electric shock, do not use the polarized plug with an extension cord, receptacle, or other outlet unless the blades can be inserted completely to prevent blade exposure.

NOTE TO CATV INSTALLERS

This is a reminder to call the CATV system installer's attention to Article 820-40 of the NEC, which provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical. For additional antenna grounding information, see items 27 and 28 on page 4.

NOTICE OF POSSIBLE ADVERSE EFFECTS ON TV PICTURE DISPLAY

If a fixed (non-moving) pattern or image remains on the TV screen for extended periods of time, the image can become permanently ingrained in the cathode ray tube(s) of the TV and cause subtle but permanent ghost images. This type of damage is NOT COVERED BY YOUR WARRANTY. See page 4 for details.

It Makes A Difference Where Your TV Stands

Congratulations on your purchase! As you enjoy your new TV, keep these safety tips in mind:

The Issue

- If you are like most consumers, you have a TV in your home. Many homes, in fact, have more than one TV. The home theater entertainment experience is a growing trend, and larger TVs are popular purchases; however, they are not always supported on the proper TV stands.
- Sometimes TVs are improperly secured or inappropriately situated on dressers, bookcases, shelves, desks, audio speakers, chests, or carts. As a result, TVs may fall over, causing unnecessary injury.

Toshiba Cares!

- The consumer electronics industry is committed to making home entertainment enjoyable and safe.
- The Consumer Electronics Association formed the Home Entertainment Support Safety Committee, comprised of TV and consumer electronics furniture manufacturers, to advocate children's safety and educate consumers and their families about television safety.

Tune Into Safety

- One size does NOT fit all! Use appropriate furniture large enough to support the weight of your TV (and other electronic components).
- Use appropriate angle braces, straps, and anchors to secure your furniture to the wall (but never screw anything directly into the TV).
- Carefully read and understand the other enclosed instructions for proper use of this product.
- Do not allow children to climb on or play with furniture and TVs.
- Avoid placing any item on top of your TV (such as a VCR, remote control, or toy) that a curious child may reach for.
- Remember that children can become excited while watching a program and can potentially push or pull a TV over.
- Share our safety message about this hidden hazard of the home with your family and friends. Thank you!



2500 Wilson Blvd.
Arlington, VA 22201 U.S.A.
Tel. 703-907-7600 Fax 703-907-7690
www.CEA.org
CEA is the Sponsor, Producer and Manager of the International CES

IMPORTANT SAFEGUARDS

Important Safety Instructions

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with a dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where it exits the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.
- 12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- 13) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Additional Safety Precautions

- 14a) **CAUTION:** If the TV is dropped and the cabinet or enclosure surface has been damaged or the TV does not operate normally, take the following precautions:
 - ALWAYS turn off the TV and unplug the power cord to avoid possible electric shock or fire.
 - To prevent personal injury, never handle the damaged television.
 - ALWAYS contact a service technician to inspect the TV any time it has been damaged or dropped.
- 15) **CAUTION:** To reduce the risk of electric shock, do not use the polarized plug with an extension cord, receptacle, or other outlet unless the blades can be inserted completely to prevent blade exposure.

Installation, Care, and Service

Installation

Follow these recommendations and precautions and heed all warnings when installing your TV:

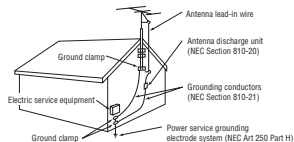
- 16) **WARNING:** To prevent the spread of fire, keep candles or other open flames away from this product at all times.
- 17) Never modify this equipment. Changes or modifications may void: a) the warranty, and b) the user's authority to operate this equipment under the rules of the Federal Communications Commission.
- 18) **DANGER: RISK OF SERIOUS PERSONAL INJURY, DEATH, OR EQUIPMENT DAMAGE!** Never place the TV on an unstable cart, stand, or table. The TV may fall, causing serious personal injury, death, or serious damage to the TV.
- 19) Never place or store the TV in direct sunlight; hot, humid areas; areas subject to excessive dust or vibration; or locations with temperatures at or below 41°F (5°C).
- 20) Always place the TV on the floor or a sturdy, level, stable surface that can support the weight of the unit.
- 21) Never place items such as vases, aquariums, or candles on top of the TV.
- 22) Never block or cover the slots or openings in the TV cabinet back, bottom, and sides. Never place the TV:
 - on a bed, sofa, rug, or similar surface;
 - too close to drapes, curtains, or walls; or
 - in a confined space such as a bookcase, built-in cabinet, or any other place with poor ventilation.
 The slots and openings are provided to protect the TV from overheating and to help maintain reliable operation of the TV.
- 23) Always place the back of the television at least one (1) inch away from any vertical surface (such as a wall) to allow proper ventilation.
- 24) Never allow anything to rest on or roll over the power cord, and never place the TV where the power cord is subject to wear or abuse.
- 25) Never overload wall outlets and extension cords.

IMPORTANT SAFEGUARDS

- 25) Always operate this equipment from a 120 V AC, 60 Hz power source only.



- 26) Always make sure the antenna system is properly grounded to provide adequate protection against voltage surges and built-up static charges (see Section 810 of the National Electric Code).



- 27) **DANGER: RISK OF SERIOUS PERSONAL INJURY OR DEATH!**
- Use extreme care to make sure you are never in a position where your body (or any item you are in contact with, such as a ladder or screwdriver) can accidentally touch overhead power lines. Never locate the antenna near overhead power lines or other electrical circuits.
 - Never attempt to install any of the following during lightning activity:
 - an antenna system; or
 - cables, wires, or any home theater component connected to an antenna or phone system.

Care

For better performance and safer operation of your TOSHIBA TV, follow these recommendations and precautions:

- 28) Always sit approximately 10-25 feet away from the TV and as directly in front of it as possible. The picture can appear dull if you sit too far to the left or right of the TV, or if sunlight or room lights reflect on the screen. Turn the TV off to check for reflections on the screen, and then remove the source of reflections while viewing the TV.

- 29) Always unplug the TV before cleaning. Never use liquid or aerosol cleaners.



- 30) **WARNING: RISK OF ELECTRIC SHOCK!** Never spill liquids or push objects of any kind into the TV cabinet slots.

- 31) *[This item applies to projection TVs only.]* If the air temperature rises suddenly (for example, when the TV is first delivered), condensation may form on the lenses. This can make the picture appear distorted or the color appear faded. If this happens, turn off the TV for 6 to 7 hours to allow the condensation to evaporate.

- 32) For added protection of your TV from lightning and power surges, always unplug the power cord and disconnect the antenna from the TV if you leave the TV unattended or unused for long periods of time.

- 33) During normal use, the TV may make occasional snapping or popping sounds. This is normal, especially when the unit is being turned on or off. If these sounds become frequent or continuous, unplug the power cord and contact a Toshiba Authorized Service Center.

- 34) **Possible Adverse Effects on TV Picture Display:** If a fixed (non-moving) pattern or image remains on the TV screen for an extended period of time, the image can become permanently ingrained in the cathode ray tube(s) of the TV and cause subtle but permanent ghost images. **This type of damage is NOT COVERED BY YOUR WARRANTY.** Never leave the TV on for extended periods of time while it is displaying the following images or formats:
- Fixed Images**, including but not limited to PIP/POP, wind station logos, stock tickers, and websites.
 - Special Formats** that do not use the entire screen, including but not limited to widescreen or letterbox format media viewed on a 4:3 aspect ratio display (with gray or black bars at the top and bottom of the screen); or 4:3 aspect ratio format media viewed on a widescreen/16:9 aspect ratio display (with gray or black bars on the left and right sides of the screen).

Service

- 35) **WARNING: RISK OF ELECTRIC SHOCK!** Never attempt to service the TV yourself. Opening and removing the covers may expose you to dangerous voltage or other hazards. Refer all servicing to a Toshiba Authorized Service Center.

- 36) If you have the TV serviced:
- Ask the service technician to use only replacement parts specified by the manufacturer.
 - Upon completion of service, ask the service technician to perform routine safety checks to determine that the TV is in safe operating condition.

- 37) When the TV reaches the end of its useful life, ask a qualified service technician to properly dispose of the TV. Improper disposal may result in a picture tube implosion and possible personal injury.



SAFETY PRECAUTION/ Power source

WARNING: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION: Changes or modifications not expressly approved by the party responsible for compliance with the FCC (Federal Communications Commission) Rules could void the user's authority to operate this equipment.

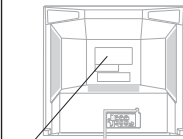
CAUTION: THIS DIGITAL VIDEO PLAYER EMPLOYS A LASER SYSTEM.

TO ENSURE PROPER USE OF THIS PRODUCT, PLEASE READ THIS OWNER'S MANUAL CAREFULLY AND RETAIN FOR FUTURE REFERENCE. SHOULD THE UNIT REQUIRE MAINTENANCE, CONTACT AN AUTHORIZED SERVICE LOCATION.

USE OF CONTROLS, ADJUSTMENTS OR THE PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

TO PREVENT DIRECT EXPOSURE TO LASER BEAM, DO NOT TRY TO OPEN THE ENCLOSURE. VISIBLE LASER RADIATION MAY BE PRESENT WHEN THE ENCLOSURE IS OPENED. DO NOT STARE INTO BEAM.

Location of the required Marking
The rating sheet and the safety caution are on the rear of the unit.



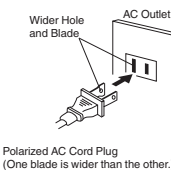
CERTIFICATION: COMPLIES WITH
FEDERAL COMMUNICATIONS COMMISSION
STANDARDS, 21 CFR SUBCHAPTER J.

WARNING: This product contains a laser beam. Do not attempt to stare at the beam through the DVD disc tray or the ventilation openings. Staring directly at the beam may cause permanent damage to your eyesight.

IMPORTANT RECYCLING INFORMATION

This product uses both Cathode Ray Tube (CRT) and other components that contain lead. In your community there might be regulations that require you to dispose these materials properly under environmental considerations. Please contact your local authorities, or the Electronic Industries Alliance (<http://www.eia.org>) for disposal or recycling information.

Power source



TO USE AC POWER SOURCE

Use the AC polarized line cord provided for operation on AC. Insert the AC cord plug into a standard 120V 60Hz polarized AC outlet.

Notes:

- Never connect the AC line cord plug to other than the specified voltage (120V 60Hz). Use the attached power cord only.
- If the polarized AC cord does not fit into a non-polarized AC outlet, do not attempt to file or cut the blade. It is the user's responsibility to have an electrician replace the obsolete outlet.
- If you cause a static discharge when touching the unit and the unit fails to function, simply unplug the unit from the AC outlet and plug it back in. The unit should return to normal operation.
- If the AC cord plug is plugged in for the first time, wait for approx. 5 seconds before pressing the POWER button.

Precautions

Notes on handling

- When shipping the unit, the original shipping carton and packing materials come in handy. For fully protection, repack the unit as it was originally packed at the factory.
- Do not use volatile liquids, such as insect spray, near the unit. Do not leave rubber or plastic products in contact with the unit for a long time. They will leave marks on the finish.
- The top and rear panels of the unit may become warm after a long period of use. This is not a malfunction.
- When the unit is not in use, be sure to remove the disc and the video cassette turn off the power.
- If you do not use the unit for a long period, the unit may not function properly in the future. Turn on and use the unit occasionally.

Notes on locating

- Place the unit on a level surface. Do not use it on a shaky or unstable surface such as a wobbling table or inclined stand. The loaded disc or the video tape may come off the proper position and cause damage to the unit.
- When you place this unit near a TV, radio, or VCR, the playback picture may become poor and the sound may be distorted. In this case, place the unit away from the TV, radio or VCR.

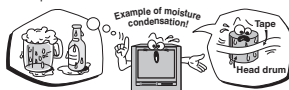
Notes on cleaning

- Use a soft, dry cloth for cleaning.
- For stubborn dirt, Do not use any type of solvent, such as thinner and benzene, as they may damage the surface of the unit.
 - If you use a chemical saturated cloth to clean the unit, follow that product's instructions.

Notes on moisture condensation

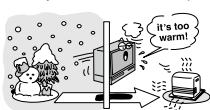
Moisture condensation damages the unit. Please read the following carefully.

Moisture condensation occurs, for example, when you pour a cold drink into a glass on a warm day. Drops of water form on the outside of the glass. In the same way, moisture may condense on the head drum or the optical pick-up lens inside this unit, one of the most crucial internal parts of the unit.



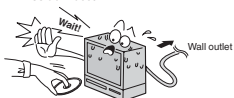
Moisture condensation occurs during the following cases.

- When you bring the unit directly from a cold place to a warm place.
- When you use the unit in a room where you just turned on the heater, or a place where the cold wind from the air conditioner directly hits the unit.
- In summer, when you use the unit in a hot and humid place just after you move the unit from an air conditioned room.
- When you use the unit in a humid place.



Do not use the unit when moisture condensation may occur.

If you use the unit in such a situation, it may damage discs and internal parts. Remove the disc or the video tape, connect the power cord of the unit to the wall outlet, turn on the unit, and leave it for two or three hours. After two or three hours, the unit will have warmed up and evaporated any moisture. Keep the unit connected to the wall outlet and moisture condensation will seldom occur.



Contents

Introduction	
IMPORTANT SAFEGUARDS.....	3
SAFETY PRECAUTION.....	5
Power source.....	5
Precautions.....	6
Contents.....	7
Notes and Information.....	8
Identification of controls.....	10
Connections	
Antenna connections.....	13
Cable TV connections.....	14
Connecting to optional equipment.....	15
Basic setup	
Starting setup.....	18
Clock setting.....	19
Setting the language.....	22
TV/VCR operation status.....	22
TV operation	
TV operation.....	23
Closed captions.....	25
To memorize channels.....	27
Setting the V-Chip.....	29
To set the on timer.....	32
To set the off timer.....	33
Picture control adjustment.....	34
Viewing the wide-screen picture formats.....	35
Sound control adjustment.....	36
Setting the StableSound®.....	36
Setting the surround sound.....	36
Stereo and Second Audio Program (SAP).....	37
Setting the digital setup (digital mode).....	38
Using the auto shut off feature.....	39
Playback (VCR)	
Loading and unloading a cassette tape.....	40
Cassette tape playback.....	41
Special playback.....	42
Convenient function.....	43
Recording (VCR)	
Recording a TV program.....	45
One-touch Timer Recording (OTR).....	46
Timer recording.....	47
Other functions (VCR)	
Duplicating a video tape.....	49
Recording a DVD/CD disc.....	50
Basic playback (DVD)	
Playing a disc.....	51
Advanced playback (DVD)	
Zooming.....	54
Locating desired scene.....	54
Repeat playback.....	55
A-B Repeat playback.....	55
Program playback.....	56
Random playback.....	56
Changing angles.....	57
Title selection.....	57
DVD menu.....	57
Changing soundtrack language.....	58
Subtitles.....	58
Disc status.....	59
To turn off the PBC.....	59
MP3/WMA/JPEG/DivX® and Audio CD operation.....	60
Function setup (DVD)	
Customizing the function settings.....	66
Temporary cancel the rating level by DVD disc.....	71
Others	
Language code list.....	72
Reception disturbances.....	73
Troubleshooting.....	74
Specifications.....	76
Limited United States Warranty.....	77

Notes and Information

On handling discs

- Do not touch the playback side of the disc.



- Do not attach paper or tape to discs.



On cleaning discs

- Fingerprints and dust on the disc cause picture and sound deterioration. Wipe the disc from the center outwards with a soft cloth. Always keep the disc clean.



- Do not use any type of solvent such as thinner, benzene, commercially available cleaners or antistatic spray for vinyl LPs. It may damage the disc.

On storing discs

- Do not store discs in a place subject to direct sunlight or near heat sources.
- Do not store discs in places subject to moisture and dust such as a bathroom or near a humidifier.
- Store discs vertically in a case. Stacking or placing objects on discs outside of their case may cause warping.

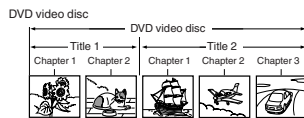
On Video CDs

This unit supports Video CDs equipped with the PBC (Version 2.0) function. (PBC is the abbreviation of Playback Control.) You can enjoy two playback variations depending on types of discs.

- Video CD not equipped with PBC function (Version 1.1)**
Sound and movie can be played on this unit in the same way as a DVD.
- Video CD equipped with PBC function (Version 2.0)**
In addition to operation of a Video CD not equipped with the PBC function, you can enjoy playback of interactive software with search function by using the menu displayed on the TV screen (Menu Playback). Some of the functions described in this owner's manual may not work with some discs.

Structure of disc contents

Normally, DVD video discs are divided into titles, and the titles are sub-divided into chapters. Video CDs and Audio CDs are divided into tracks.



Each title, chapter or track is assigned a number, which is called "title number", "chapter number" or "track number" respectively. There may be discs that do not have these numbers.

Notes on region numbers

The region number of this unit is 1. If region numbers, which stand for their playable area, are printed on your DVD video disc and you do not find 1 or 1, disc playback will not be allowed by the player. (In this case, the unit will display a message on-screen.)

Notes on copyright

The unauthorized recording, use, distribution, or revision of copyrighted materials including, without limitation, television programs, videotapes, and DVDs, is prohibited under the Copyright Laws of the United States and other countries, and may subject you to civil and criminal liability.

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

Playable discs

This unit can play the following discs.

Disc Mark	Contents	Disc Size	Maximum playback time
DVD video discs	Audio + Video (moving pictures)	12 cm	Approx. 4 hours (single sided disc)
		8 cm	Approx. 8 hours (double sided disc) Approx. 80 minutes (single sided disc) Approx. 160 minutes (double sided disc)
Video CDs	Audio + Video (moving pictures)	12 cm	Approx. 74 minutes (single sided disc)
		8 cm	Approx. 20 minutes (single sided disc)
Audio CDs	Audio	12 cm	Approx. 74 minutes (single sided disc)
		8 cm	Approx. 20 minutes (single sided disc)
DivX®	Audio + Video (moving pictures)	12 cm	It depends on DivX® quality
		8 cm	

The following discs are also available.

- DVD-R/RW discs of DVD video format
- CD-R/CD-RW discs of CD-DA, Video CD, MP3, WMA, JPEG or DivX® format
- Kodak picture CD and FUJICOLOR CD format

- You cannot play discs other than those listed above.
- You cannot play discs of DVD-RAM, DVD-ROM, CD-ROM, Photo CD, etc., or non-standardized discs even if they may be labeled as above.
- Some CD-R/RWs cannot be played back depending on the recording conditions.
- This unit uses the NTSC color system, and cannot play DVD video discs recorded in any other color system (PAL, SECAM, etc.).

Because of problems and errors that can occur during the creation of DVD and CD Software and/or the manufacture of DVD and CD discs, Toshiba cannot assure that the DVD player contained in this television will successfully play every disc bearing the DVD and CD logos. If you happen to experience any difficulty playing a DVD and/or CD disc on the DVD player contained in this television, please contact Toshiba Customer Service.

DVD is a trademark of DVD Format/Logo Licensing Corporation.

About this owner's manual

This owner's manual explains the basic instructions of this unit. Some DVD video discs are produced in a manner that allows specific or limited operation during playback. As such, the unit may not respond to all operating commands. This is not a defect in the unit. Refer to instruction notes of discs.

The following symbol may appear on the TV screen during operation.

X

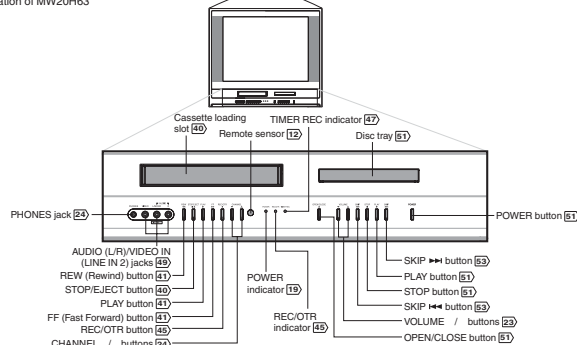
It means that the operation is not permitted by the unit or the disc. For example, sometimes it is unable to stop the playback of copyright message of the disc when the STOP () button is pressed. Alternatively, this symbol may also indicate that the feature is not available for the disc.

Identification of controls

See the page in [] for details.

Front panel

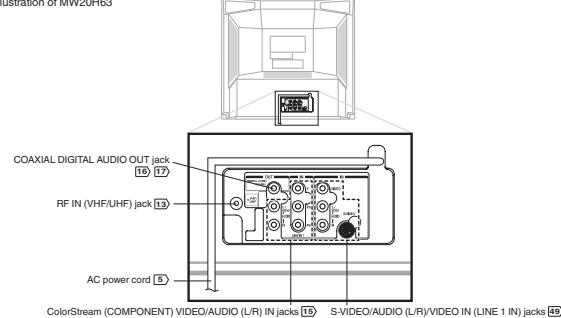
Illustration of MW20H63



Model MW27H63 has a door on the front panel. Please open it to access the PHONES jack and the AUDIO (L/R)/VIDEO IN (LINE IN 2) jacks.

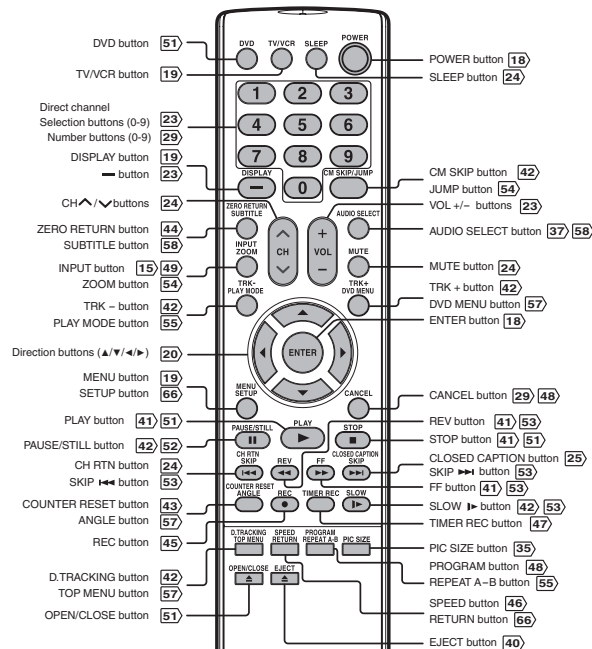
Rear panel

Illustration of MW20H63



Remote control

The instructions in this manual describe the function on the remote control. See the page in [] for details.



Identification of controls (Continued)

Inserting batteries

- 1 Open the battery compartment cover in the direction of the arrow.
- 2 Install two "R03/AAA" batteries (supplied), paying attention to the polarity diagram in the battery compartment.
- 3 Replace the compartment cover.

Caution:
Never throw batteries into a fire.

Notes:

- Be sure to use AAA size batteries.
- Dispose of batteries in a designated disposal area.
- Batteries should always be disposed of with the environment in mind. Always dispose of batteries in accordance with applicable laws and regulations.
- If the remote control does not operate correctly, or if the operating range becomes reduced, replace batteries with new ones.
- When necessary to replace batteries in the remote control, always replace both batteries with new ones. Never mix battery types or use new and used batteries in combination.
- Always remove batteries from remote control if they are dead or if the remote control is not to be used for an extended period of time. This will prevent battery acid from leaking into the battery compartment.

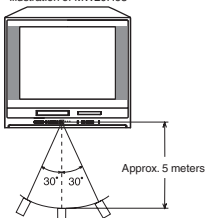
Remote control basics

- Press **POWER** to turn the unit on or off.
- Select your desired operating mode (TV/VCR or DVD) using **TV/VCR** or **DVD**.
- Tap **CH A** or **Y** to move through the channels one channel at a time.
- The **Direction** buttons (**←**, **→**, **↑**, **↓**) are also used to navigate on-screen menu system.
- You can directly access specific channels using **Direct channel selection** buttons.

Operation:

- Aim the remote control at the remote sensor and press control buttons to operate.
- Operate the remote control within 30° angle on either side of the remote sensor, up to a distance of approx. 5 meters.

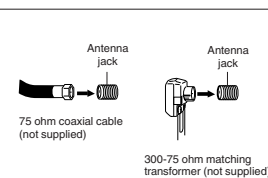
Illustration of MW20H63



Antenna connections

If you are using an indoor or outdoor antenna, follow the instructions below that correspond to your antenna system.
If you are using a cable TV service (CABLE), see Cable TV connections (13).

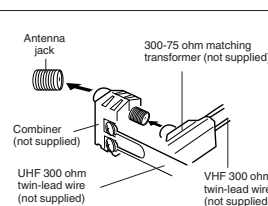
Combination VHF/UHF antenna (Single 75 ohm cable or 300 ohm twin-lead wire)



Connect the 75 ohm cable from the combination VHF/UHF antenna to the antenna jack.

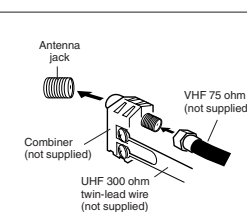
If your combination VHF/UHF antenna has a 300 ohm twin-lead wire, the use of the 300-75 ohm matching transformer (not supplied) may be necessary.

Combination VHF/UHF antenna (Separate VHF and UHF 300 ohm twin-lead wires)



Connect the UHF 300 ohm twin-lead wire to the combiner (not supplied). Connect the VHF 300 ohm twin-lead wire to the 300-75 ohm matching transformer (not supplied). Attach the transformer to the combiner, then attach the combiner to the antenna jack.

Separate VHF/UHF antennas (75 ohm VHF cable and 300 ohm UHF twin-lead wires)

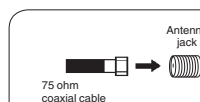


Connect the VHF 75 ohm cable and UHF 300 ohm twin-lead wire to the combiner (not supplied). Attach the combiner to the antenna jack.

Cable TV connections

This unit has an extended tuning range and can tune most cable channels without using a Cable TV converter box. Some cable companies offer "premium pay channels" in which the signal is scrambled. Descrambling these signals for normal viewing requires the use of a descrambler device which is generally provided by the cable company.

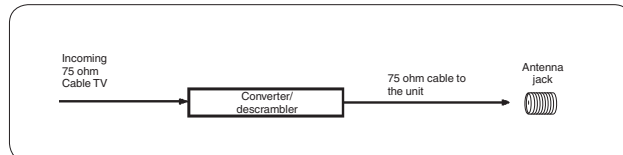
For subscribers to basic cable TV service



For basic cable service not requiring a converter/descrambler box, connect the Cable TV 75 ohm coaxial cable directly to the Antenna jack on the back of the unit.

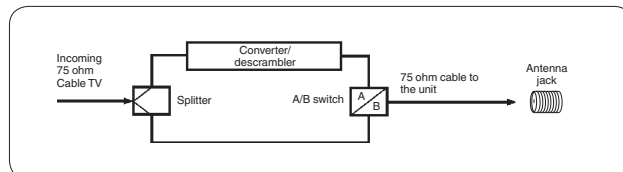
For subscribers to scrambled cable TV service

If you subscribe to a cable TV service which requires the use of a converter/descrambler box, connect the incoming 75 ohm coaxial cable to the converter/descrambler box. Using another 75 ohm coaxial cable, connect the output jack of the converter/descrambler box to the antenna jack on the unit. Follow the connections shown below. Set the unit to the output channel of the converter/descrambler box (usually channel 3 or 4) and use the converter/descrambler box to select channels.



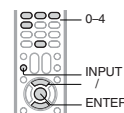
For subscribers to unscrambled basic cable TV service with scrambled premium channels

If you subscribe to a cable TV service in which basic channels are unscrambled and premium channels require the use of a converter/descrambler box, you may wish to use a signal splitter and an A/B Switch box (available from the cable company or an electronics supply store). Follow the connections shown below. With the switch in the "B" position, you can directly tune any unscrambled channels on your unit. With the switch in the "A" position, tune your unit to the output of the converter/descrambler box (usually channel 3 or 4) and use the converter/descrambler box to tune scrambled channels.



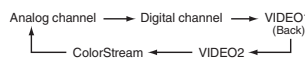
Connecting to optional equipment

Before connecting the unit to other equipment, be sure to turn off the power and unplug all of the equipment from the wall outlet before making any connections. You can enjoy the camcorder or high quality dynamic sounds of DVD video discs or audio CDs by connecting the unit to optional audio equipment.



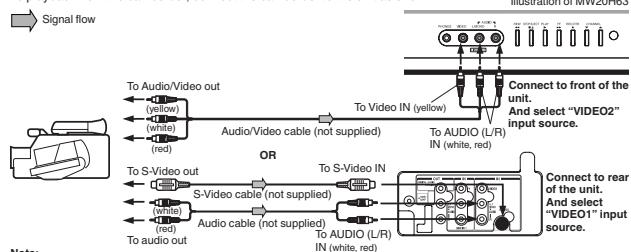
Using the audio/video inputs

Press **INPUT**. Press **←** or **Number buttons (0-4)** to select the desired mode, then press **ENTER**. "VIDEO1", "VIDEO2", "ColorStream", Analog channel or Digital channel will display on the screen for 4 seconds.



Connecting to a camcorder

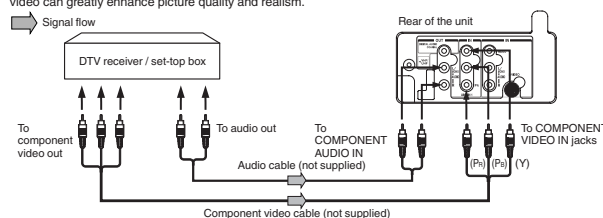
To playback from the camcorder, connect the camcorder to the unit as shown.



Note:
If your camcorder has S-video, you can use an S-video cable (plus the standard audio cables) instead of a standard video cable for better picture quality. S-video jack is on the backside of the unit. Do not connect both a standard video cable and an S-video cable at the same time, or the picture performance will be unacceptable.

Connecting to a DTV receiver / set-top box with ColorStream® (component video)

This connection allows you to watch DTV (digital TV) and TV programs, and record DTV and TV programs. Your TV has ColorStream® (component video) inputs. Connecting your TV to a DTV receiver with component video can greatly enhance picture quality and realism.



Connecting to optional equipment (Continued)

You can enjoy high quality dynamic sounds by connecting the unit to optional audio equipment.

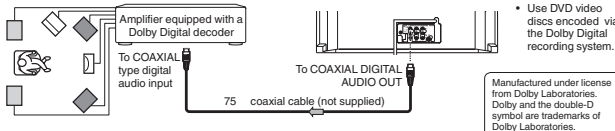
This section uses the following reference mark.

- : Front speaker
- : Rear speaker
- : Sub woofer
- : Center speaker
- : Signal flow

Connecting to an amplifier equipped with a Dolby® Digital decoder

Dolby Digital

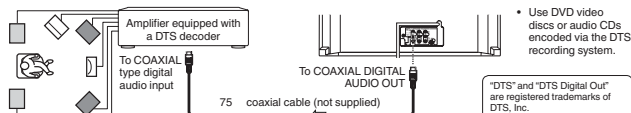
Dolby Digital is the surround sound technology used in theaters showing the latest movies, and is now available to reproduce this realistic effect in the home. You can enjoy motion picture and live concert DVD video discs with this dynamic realistic sound by connecting the unit to a 6 channel amplifier equipped with a Dolby Digital decoder or Dolby Digital processor. If you have a Dolby Surround Pro Logic decoder, you will obtain the full benefit of Pro Logic from the same DVD movies that provide full 5.1-channel Dolby Digital soundtracks, as well as from titles with the Dolby Surround mark.



Connecting to an amplifier equipped with a DTS® decoder

Digital Theater Systems (DTS)

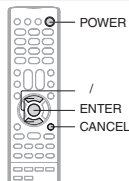
DTS is a high quality surround technology used in theaters and now available for home use, on DVD video discs or audio CDs. If you have a DTS decoder or processor, you can obtain the full benefit of 5.1 channel DTS encoded sound tracks on DVD video discs or audio CDs.



Basic setup

Starting setup

The STARTING SETUP function help to install your unit easily. It leads you the Language selection, TV/CABLE selection and auto channel memory automatically. **IMPORTANT: Make sure that the antenna or cable TV system connection is made!**



Starting setup

- Press **POWER**. The starting setup function begins and the Language setup menu appears on the screen. Press **ENTER** or **TV/CABLE** to select your desired language, then press **ENTER**.



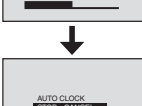
- Press **ENTER** or **TV/CABLE** to select "TV" or "CABLE", then press **ENTER**.



- Press **ENTER** or **START** to select "START", then press **ENTER**. If you select "CANCEL" and press **ENTER**, the STARTING SETUP stops and changes to the TV screen.



- Now the "CH PROGRAM" and "AUTO CLOCK" starts. After the starting setup is completed, the TV channel appears on the screen.

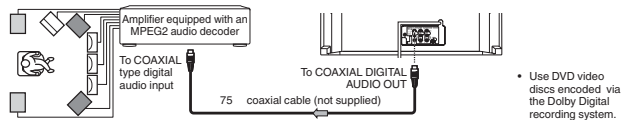


- Notes:**
- The starting setup function will work only when you press **POWER** for the first time.
 - In "AUTO CLOCK" setting, it may take more than 10 minutes to read the EDS signal for one channel, which has only "Time of day" or "Local time zone".
 - The process of "CH PROGRAM" may take 15 - 30 minutes to complete, depending on your regional cable service.
 - If you press **CANCEL** in the process of "CH PROGRAM", you can do starting setup function again.

Connecting to an amplifier equipped with a MPEG audio decoder

MPEG2 sound

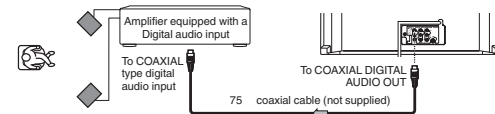
You can enjoy motion picture and live concert DVD video discs with dynamic realistic sound by connecting an amplifier equipped with an MPEG2 audio decoder or MPEG2 audio processor.



Connecting to an amplifier equipped with a digital audio input

2 channel digital stereo

You can enjoy the dynamic sound of 2 channel digital stereo by connecting an amplifier equipped with a digital audio input and speaker system (right and left front speakers).



Notes:

- DO NOT connect the COAXIAL DIGITAL AUDIO OUT jack of the unit to the AC-3 RF input of a Dolby Digital Receiver. This input on your A/V Receiver is reserved for Laserdisc use only and is incompatible with the COAXIAL DIGITAL AUDIO OUT jack of the unit.
- Connect the COAXIAL DIGITAL AUDIO OUT jack of the unit to the "COAXIAL" input of a Receiver or Processor.
- Refer to the owner's manual of the connected equipment as well.
- When you connect the unit to other equipment, be sure to turn off the power and unplug all of the equipment from the wall outlet before making any connections.
- The output sound of the unit has a wide dynamic range. Be sure to adjust the receiver's volume to a moderate listening level. Otherwise, the speakers may be damaged by a sudden high volume sound.
- Turn off the amplifier before you connect or disconnect the unit's power cord. If you leave the amplifier's power on, the speakers may be damaged.

Clock setting

The auto clock function will automatically set the built-in clock (Month, Day, Year and Time) when the unit is connected to an antenna or cable system and it is turned off. As the unit searches for a receivable station in your area and it receives a broadcast signal (analog) for auto clock, the auto clock needs several minutes to set itself.

Auto clock setting

Preparation:

- Connect the antenna or cable system.
- If you use a cable box, turn it on.
- Plug the AC power cord to the AC outlet.

- Make sure the unit is turned off.
 - If you press **POWER**, the Auto Clock set is not effective.

- Wait at least three minutes and press **POWER**.
 - Depending on the reception condition, it may take approx. thirty minutes.
 - The POWER indicator will light.



- Press **TV/VCR** to select TV/VCR mode. Then press **DISPLAY** to check the clock on the screen.



- If the clock is not set, check the antenna condition. The Auto clock may not function properly if the reception condition is not good.

Auto clock adjustment

The Auto clock adjustment will be performed at 12:00 PM everyday if you turn off the unit.

- If you use a cable box and you want Auto Clock adjustment to be performed, the cable box must be left on.
- The Auto Clock adjustment is not effective when there is a difference of more than 5 minutes exists between the built-in clock time and the actual time.

To set auto clock to OFF

When shipped from factory the AUTO CLOCK is set to "ON". But if you do not want auto clock set (Adjustment):

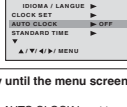
- Press **MENU**, then press **ENTER** or **select** **LANGUAGE/IDOMA/LANGUE**.



- Press **ENTER** or **select** "AUTO CLOCK".



- Press **ENTER** or **select** "OFF".

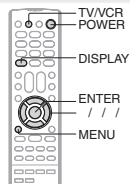


- Press **MENU** repeatedly until the menu screen is cleared.
 - When the AUTO CLOCK is set to "OFF", the Auto Clock adjustment does not function.
 - Set the clock manually.



- Notes:**
- If the unit does not operate properly, or No key operation (by the unit and/or the remote control): Static electricity, etc., may affect the player's operation. Disconnect the AC power cord once, then connect it again.
 - The TV section has its own menu and also DVD section has its own menu.
 - If no buttons are pressed for more than about 60 seconds, the TV/VCR menu screen will return to normal TV operation automatically.

Clock setting (Continued)



To set standard time

In the rare event that you live within broadcast range of two stations in two different time zones, the unit may recognize the wrong station for the auto clock set. To correct the situation:

- Press **MENU**, then press **ENTER** or **ENTER** to select **OPTION**.
- Press **ENTER** or **ENTER** to select **"STANDARD TIME"**, then press **ENTER**.
- Press **ENTER** or **ENTER** to select your time zone, then press **ENTER**.

ATLANTIC	: GMT-4hours
EASTERN	: GMT-5hours
CENTRAL	: GMT-6hours
MOUNTAIN	: GMT-7hours
PACIFIC	: GMT-8hours
ALASKA	: GMT-9hours
HAWAII	: GMT-10hours
AUTO	: AUTO SET (GMT: Greenwich Mean Time)
- Press **MENU** repeatedly until the menu screen is cleared.

Notes:
To be able to select the standard time, the clock must first be set by "AUTO CLOCK" once.

To set daylight saving time

You can set the daylight saving time automatically or manually.

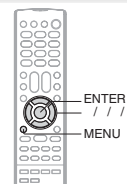
- Press **MENU**, then press **ENTER** or **ENTER** to select **OPTION**.
- Press **ENTER** or **ENTER** to select **"DAYLIGHT SAVING TIME"**, then press **ENTER**.
- Press **ENTER** or **ENTER** to select one of the options, then press **ENTER**.

ON: for manual setting (forward one hour)
OFF: for manual setting (back one hour)
AUTO: for automatic setting (read EDS in the signal)

When you want to set the daylight saving time manually, on the first Sunday in April you set to "ON", and on the last Sunday in October you set to "OFF".
- Press **MENU** repeatedly until the menu screen is cleared.

Notes:

- When shipped from factory, the DAYLIGHT SAVING TIME is set to "AUTO" position.
- When the clock is not set, daylight saving time setting is not available.
- When there is no daylight saving time in your area, always select "OFF" position in step 3.



Manual clock setting

You must set the date and time manually for timer recordings, ON/OFF timer and daylight saving time if the auto clock process did not set them correctly.

Example: Setting the clock to "8:30 AM", 31th. (SAT) March, 2007.

- Press **MENU**, then press **ENTER** or **ENTER** to select **OPTION**.
- Press **ENTER** or **ENTER** to select **"CLOCK SET"**, then press **ENTER**.
- Press **ENTER** or **ENTER** to set the month, then press **ENTER**.

4 Set the day, year and time as in step 3, then press ENTER.

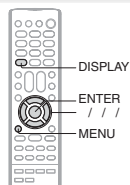
- After setting the clock, date and time starts functioning automatically.

■ To make corrections anytime during the process
Press or repeatedly until the item you want to change blinks, then set the item again.

Notes:

- After a power failure or disconnection of the power, the timer settings will be lost. In this case, reset the present time.
- When you set the minute, you can change in 10-minutes step by holding down or .

Setting the language/ TV/VCR operation status



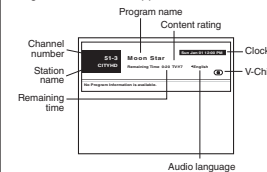
Setting the language

This unit can display the on screen language in English, Spanish or French.

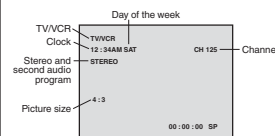
- Press **MENU**, then press **ENTER** or **ENTER** to select **OPTION**.
- Press **ENTER** or **ENTER** to select **"LANGUAGE/DIOMA/LANGUE"**, then press **ENTER**.
- Press **ENTER** or **ENTER** to select the desired language: English (ENGLISH), Spanish (ESPAÑOL) or French (FRANÇAIS), then press **ENTER**.
- Press **MENU** repeatedly until the menu screen is cleared.

TV/VCR operation status

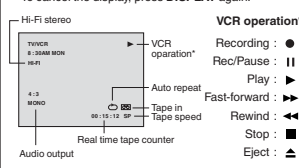
While watching TV
Press **DISPLAY** to display the information on the screen. When the TV receives a digital signal, press once, the digital information will appear.



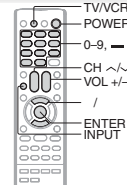
Press **DISPLAY** again, the analog information will appear. To cancel the display, press **DISPLAY** again.



While operating a tape
Press **DISPLAY** to display the information on the screen. To cancel the display, press **DISPLAY** again.



TV operation



TV operation

- To turn on the unit, press **POWER**. The power indicator will light.
 - Every time you turn on the TV, the unit starts from TV/VCR mode. When you use TV/VCR after DVD operation, press **TV/VCR**.
- Adjust the volume level by pressing **VOL +/-**. The volume level will be indicated on the screen by green bars. As the volume level increases, so do the number of bars. If the volume decreases, the number of green bars also decreases.
- Set the TV/CABLE selection to the appropriate position.
- Press **INPUT**. Then press or Number buttons (0-9) to select the desired mode (0: ANALOG MODE, 1: DIGITAL MODE), then press **ENTER**.

5 Press CH +/- or Direct channel selection buttons (0-9) and button to select the channel.

To change to a specific channel (programmed or unprogrammed):
Press Direct channel selection buttons (0-9) on the remote control. For example, to select channel 125, press 1, 2, 5.

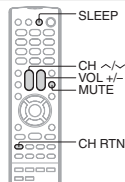
To change to a specific digital channel:
Press the first 3 digits, then press **ENTER**, followed by the remaining 3 digits. For example, to select channel 015-001, press 0, 1, 5, **ENTER**, 0, 0, 1.

TV	Cable TV
VHF 2-13	VHF 2-13
UHF 14-69	STD/HRC/IRC 14-36 (A) (W) 37-59 (AA) (VV) 60-85 (AAA) (ZZZ) 86-94 (BB) (94) 95-99 (A-S) (A-1) 100-125 (100) (125) 01 (5A)

Notes:

- Digital cable channels may be represented by channel numbers that include a "dash" (e.g., 85-002.) These digital channel numbers may not match the numbers in the channel line-up provided by your cable company. This is not a malfunction.
- If a channel with no broadcast is selected, the sound will automatically be muted.
- If a station being viewed stops broadcasting, the TV will automatically shut itself off after 15 minutes.

TV operation (Continued)



TV operation

CHANNEL UP/DOWN

Press and release **CH +/-**. The channel automatically stops at the next channel set into memory. For proper operation, before selecting channels, they should be set into the memory. See page 22 "To memorize channels".



CHANNEL RETURN

This button allows you to go back to the last channel selected by pressing **CH RTN**. Press **CH RTN** again to return to the last channel you were watching.



Note:
The CHANNEL RETURN feature is invalid between other input sources.

MUTE

Press **MUTE** to switch off the sound. The unit's sound will be silenced and "MUTE" will appear briefly on the screen. The sound can be switched back on by pressing this button again or **VOL +/-**.



SLEEP

To set the unit to turn off after a preset amount of time, press **SLEEP** on the remote control. The clock will count down 10 minutes for each press of **SLEEP** (120, 110, ..., 10, 0). After the sleep time is programmed, the display will appear briefly every ten minutes to remind you that the sleep timer is operating. To confirm the sleep timer setting, press **SLEEP** and the remaining time will be displayed for a few seconds. To cancel the sleep timer, press **SLEEP** repeatedly until the display turns to 0.

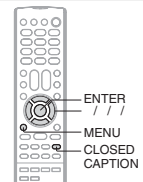


HEADPHONES

Insert a stereo headphones (not supplied) with a 1/8" mini plug into the PHONES jack on the front panel. If you connect headphones, the sound from TV speakers is muted.
* Model MW27H63 has a door on the front panel. Please open it to access the PHONES jack.



Closed captions



Closed captions

WHAT IS CLOSED CAPTIONING?

This television has the capability to decode and display closed captioned television programs. Closed captioning will display text on the screen for hearing impaired viewers or it will translate and display text in another language.

The Closed Caption feature has two options:

- **Captions**—An on-screen display of the dialog, narration, and sound effects of programs and videos that are closed-captioned (usually identified as "CC").
- **Text**—An on-screen display of information not related to the program, such as weather or stock data (if available in your viewing area.)

Notes:

- When selecting closed captions, the captioning will be delayed approximately 10 seconds.
- If no caption signal is received, no captions will appear, but the television will remain in the caption mode.
- Misspellings or unusual characters may occasionally appear during closed captioning. This is normal with closed captioning, especially with live programs. This is because during live programs, captions are also entered live. These transmissions do not allow time for editing.
- When captions are being displayed, on-screen displays, such as volume and mute may not be seen or may interfere with closed captions.
- Some cable systems and copy protection systems may interfere with the closed captioned signal.
- A closed caption signal may not be decoded in the following situations:
 - when a video tape has been dubbed
 - when the signal reception is weak
 - when the signal reception is non-standard

NOTICE OF POSSIBLE ADVERSE EFFECTS ON TV PICTURE DISPLAY

Avoid displaying stationary images on your TV screen for extended periods of time. Fixed (non-moving) patterns or images (including but not limited to PIP/POP wind closed captions, video game patterns, TV station logos, stock tickers, websites, and special formats that do not use the entire screen) can become permanently ingrained in the cathode ray tube(s) of the TV and cause subtle but permanent ghost images. This type of damage is NOT COVERED BY YOUR WARRANTY. See item 34 on page 4.

To view closed captions (analog mode)

1 Tune the unit to the desired channel in the analog mode. Press **MENU**, then press or to select **72** option.



2 Press or to select "CLOSED CAPTION", then press .

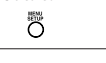


3 Press or to select the desired Closed Caption mode, then press **ENTER**.

- To view captions, select C1 or C2 (C1 displays translation of the primary language in your area.)
Note: If the program or video you selected is not closed captioned, no captions will display on-screen.
- To view text, select T1 or T2.
Note: If text is not available in your viewing area, a black rectangle may appear on-screen. If this happens, set the Closed Caption feature to OFF.
- To turn the Closed Caption feature off, select OFF in the Closed Caption menu.



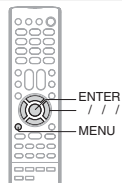
4 Press **MENU** repeatedly until the menu screen is cleared.



Notes:

You also can display the CLOSED CAPTION menu screen by pressing **CLOSED CAPTION** on the remote control.

Closed captions (Continued)



To view closed captions (digital mode)

1 Tune the unit to the desired channel in the digital mode. Press **MENU**, then press or to select **72** option.



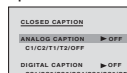
2 Press or to select "DIGITAL SETUP", then press .



3 Press or to select "CLOSED CAPTION", then press .



4 Press or to select "ANALOG CAPTION" or "DIGITAL CAPTION", then press .



5 Press or to select the desired Closed Caption mode, then press **ENTER**.



6 Press **MENU** repeatedly until the menu screen is cleared.



CC Advanced feature (digital mode)

1 Follow the left steps 1-2.

2 Press or to select "CC ADVANCED", then press .



3 Press or to select the desired item to adjust, then press .



4 Press or to select the desired setting, then press **ENTER**.



You can select from among the following items and parameters:

TEXT SIZE: AUTO, SMALL, STANDARD, LARGE
TEXT TYPE: AUTO, DEFAULT, MONO W. SERIF, PROP W. SERIF, MONO W/O SERIF, PROP W/O SERIF, CASUAL, CURSIVE, SMALL CAPITALS
TEXT EDGE: AUTO, NONE, RAISED, DE PRESSED, UNIFORM, LEFT DROP SHADOW, RIGHT DROP SHADOW
TEXT COLOR: AUTO, BLACK, WHITE, RED, GREEN, BLUE, YELLOW, MAGENTA, CYAN
BACKGROUND COLOR: AUTO, BLACK, WHITE, RED, GREEN, BLUE, YELLOW, MAGENTA, CYAN

Note:

It is impossible to select the same color with TEXT COLOR and BACKGROUND COLOR.

To memorize channels

This unit is equipped with a channel memory feature which allows channels to skip up or down to the next channel set into memory, skipping over unwanted channels. Before selecting channels, they must be programmed into the unit's memory. To use this unit with an antenna, set the TV/CABLE selection to the TV position. When shipped from the factory, this selection is in the CABLE position.

TV/CABLE selection

1 Press **MENU** in the TV mode, then press or to select **72** option.



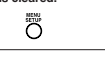
2 Press or to select "TV/CABLE".



3 Press or to select "TV" or "CABLE".
TV - VHF/UHF channels
CABLE - Cable TV channels



4 Press **MENU** repeatedly until the menu screen is cleared.



Note:

You cannot select "TV/CABLE" and "CH PROGRAM" features if you set the channel to "VIDEO1", "VIDEO2" or "ColorStream".

Automatic memory tuning

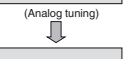
1 Press **MENU** in the TV mode, then press or to select **72** option.



2 Press or to select "CH PROGRAM".



3 Press to start "CH PROGRAM". The unit will begin memorizing all the channels available in your area.

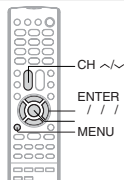


When channel programming is complete, the message "COMPLETED" appears.

5 Press **CH +/-** to view the programmed channels.



To memorize channels (Continued)



To ADD/ERASE channels (analog mode)

After you have programmed the channels automatically, you can add or erase specific channels manually.

- Press **MENU** in the analog mode, then press or to select **[V-CHIP]** option.
- Press or to select **"ADD/ERASE"**, then press .
- Select the desired channel to be memorized or deleted using or . Then press or to select either **ADD** or **ERASE**.
- Repeat step 3 for other channels you want to add or erase, then press **ENTER**.
- Press **MENU** repeatedly until the menu screen is cleared.

To ADD/ERASE channels (digital mode)

After you have programmed the channels automatically, you can add or erase specific channels manually.

- Press **MENU** in the digital mode, then press or to select **[V-CHIP]** option.
- Press or to select **"DIGITAL SETUP"**, then press .
- Press or to select **"ADD/ERASE"**, then press .
- Press or to select **"ADD/ERASE"**, then press . Select the desired channel to be memorized or deleted using or . Then press or to select either **ADD** or **ERASE**.
- Repeat step 4 for other channels you want to add or erase.
- Press **MENU** repeatedly until the menu screen is cleared.

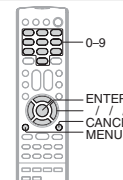
To add a digital channel you are watching:
Select a channel you want to add. Then select **"ADDING CHANNEL"** in step 4, then press .

Setting the V-Chip

An age limitation can be set to forbid children to watch programs according to "TV RATING" and "MOVIE RATING" level set. To use the V-Chip function, you must register a password.

Notes:

- If you forget the password, you cannot set the V-Chip.
- To avoid forgetting the password, write it down and keep in the safe place.



To register password

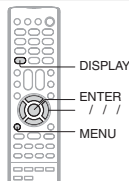
- Press **MENU**, then press or to select **[V-CHIP]** option.
- Press or to select **"V-CHIP"**, then press .
- Enter the password (4 digits) using Number buttons (0-9), then press **ENTER**.
If you input a wrong number, press **CANCEL**.
- Enter the same password again using Number buttons (0-9) for safety, then press **ENTER**.
Now the password is registered and V-Chip setting menu will appear on the display.

To change password

- In the V-CHIP menu, press or to select **"CHANGE PASSWORD"**, then press .
- Enter the new password using Number buttons (0-9), then press **ENTER**.
- Enter the same password again using Number buttons (0-9) for safety, then press **ENTER**.
- Press **MENU** repeatedly until the menu screen is cleared.

TV operation

Setting the V-Chip (Continued)

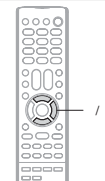


To set the V-Chip

- In the V-CHIP menu, press or to select **"V-CHIP SET"**, then press .
- Press or to select **"TV RATING"**, then press or to display the desired setting.
- Press or to select **"MOVIE RATING"**, then press .
- Press or to select desired rating, then press or to select **ON** or **OFF**. Press **ENTER** twice.
- Press or to select **"V-CHIP"**.
- Press or to display **"ON"**. Now your settings are set into the memory.
- Press **MENU** repeatedly until the menu screen is cleared.

To use after the TV is protected
When the program applied to the V-Chip setting is received, enter the password, then press **ENTER**. Protection can be canceled.
Note:
The V-Chip function is activated only on programs that have the rating signal.

As a supplement to the standard V-Chip rating system, your Toshiba Television will be able to download an additional rating system, if such a system becomes available in the future.



To download the additional V-Chip rating system (when available)

- In the V-CHIP menu, press or to select **"V-CHIP SET (DTV)"**, then press . (You cannot select this feature if the TV is not receiving a digital signal for the current station.)
- If the TV is not storing the additional rating system, the TV will begin downloading it, which may take some time to be completed.
- Press or to select **"RRT SET"**, then press , and set your preferred content rating limits for the additional rating system.

PLEASE NOTE THE FOLLOWING:

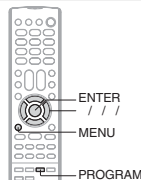
- You can only download the additional V-Chip rating system when your TV is receiving a digital signal.
- When you download the additional rating system, it may take some time for the download to occur.
- The V-Chip rating information and system are not determined or controlled by the TV or Toshiba.
- The standard V-Chip rating system is available whether your TV is receiving a digital signal or not, and will block both analog and digital programs. To set program blocking using the standard V-Chip rating system, select V-CHIP SET in step 1 (see page 28 for details).

The downloadable V-Chip rating system is an evolving technology, and availability, content, and format may vary.

TV operation

To set the on timer

This feature allows you to have the unit automatically turn on at a predetermined time. If you program the ON TIMER once, the unit will turn on the programmed day (daily/weekly) at the same time to the same channel.



To set the on timer

Example: Turning on the TV to channel 051-001 (Digital channel) at 7:00 AM, MONDAY-FRIDAY.

1 Press MENU. Press or to select option. You can also select ON/OFF TIMER by pressing PROGRAM twice.



2 Press or to select "ON/OFF TIMER", then press .



3 Press or to select "ON TIMER", then press .



4 Press or to set the desired hour, then press .



5 Set the desired minute, channel (Digital or Analog) and daily or weekly timer date as in step 4.



6 Press or to select "SET", then press ENTER.



7 Press MENU repeatedly until the menu screen is cleared.

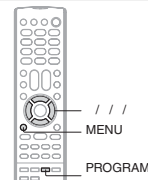


Notes:

- The unit will automatically turn off approximately 1 hour later after the ON TIMER turns on if no OFF TIMER has been set. To continue watching the TV, press any button to cancel the one hour automatic shut off.
- To cancel the ON TIMER, follow above steps 1-5, then press or to select "CANCEL". Press MENU repeatedly until the menu screen is cleared.
- After setting the ON TIMER, "OFF TIMER" will be highlighted. If you wish to set the OFF TIMER, press then follow the steps 4-6 on page 33.
- If you want to correct the digits while setting, press or until the item you want to correct, then press or to correct the desired setting.

To set the off timer

This feature allows you to have the unit turn off automatically at a predetermined time. If you program the OFF TIMER once, the unit will automatically turn off at the same time everyday.



To set the off timer

Example: Turning off the TV at 11:30 AM.

1 Press MENU. Press or to select option. You can also select ON/OFF TIMER by pressing PROGRAM twice.



2 Press or to select "ON/OFF TIMER", then press .



3 Press or to select "OFF TIMER", then press .



4 Press or to set the desired hour, then press .



5 Press or to set the desired minute, then press .



6 Press or to select "SET", then press ENTER.



7 Press MENU repeatedly until the menu screen is cleared.

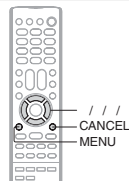


Notes:

- To cancel the OFF TIMER function: To cancel OFF timer, follow above steps 1-5, press or to select "CANCEL". Press MENU repeatedly until the menu screen is cleared.
- To confirm the ON/OFF TIMER: Press PROGRAM twice to indicate the programs on the screen.

Picture control adjustment

Picture controls are factory preset but you can adjust them individually as follows:



Picture control adjustment

1 Press MENU, then press or to select option, then press .



2 Press or to select the item you want to adjust, then press or to adjust the setting.



Selection	Pressing
BRIGHTNESS	darker lighter
CONTRAST	lower higher
COLOR	paler deeper
TINT	reddish greenish
SHARPNESS	softer sharper

Note:
The CONTRAST default setting is set to maximum (+32) at the factory.

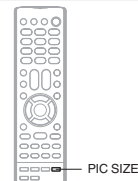
3 Press MENU repeatedly until the menu screen is cleared.



To return all adjustments to the factory preset levels
Press CANCEL while making picture adjustments.

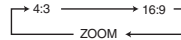
Viewing the wide-screen picture formats

You can view 480i format programs in a variety of picture sizes—4:3, 16:9, ZOOM.
The way the image displays in any of the picture sizes will vary depending on the format of the program you are viewing. Select the picture size that displays the current program the way that looks best to you.



Viewing the wide-screen picture formats

Press PIC SIZE repeatedly on the remote control to cycle among the three picture sizes, as described below.

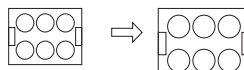


Available picture sizes for the various input sources

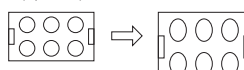
Input source	Picture size		
	4:3	16:9	ZOOM
4:3 format program (analog) or External input			X
4:3 format program (digital)		X	X
16:9 (Squeeze) format program (digital)			

4:3 picture size

If receiving a 4:3 format (analog or digital) program, select 4:3 PIC SIZE will typically display the image in its original formatted proportion.



If receiving a 16:9 format (digital) program, select 4:3 PIC SIZE will typically display the image stretched taller (squeezed).

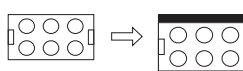


16:9 picture size

- If receiving a 4:3 format digital program, the 16:9 PIC SIZE is not available.
- If receiving a 4:3 format analog program, select 16:9 PIC SIZE will typically display the image stretched wider with bars at the top and bottom.

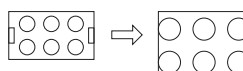


If receiving a 16:9 format (digital) program, select 16:9 PIC SIZE will typically display the image in its original formatted proportion with bars at the top and bottom.



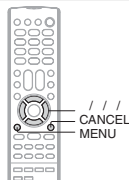
ZOOM picture size (for 16:9 format programs)

- If receiving a 4:3 format (analog or digital) program, the ZOOM PIC SIZE is not available.
- If receiving a 16:9 format (digital) program, select ZOOM PIC SIZE will typically enlarge the image, retaining the original formatted proportion, but with the sides edges hidden.



Sound control adjustment/Setting the StableSound®/Setting the surround sound

Sound controls are factory preset but you can adjust them individually as follows:



Sound control adjustment

- 1** Press MENU and then press or to select option.



- 2** Press or to select the item you want to adjust, then press or to adjust the setting.



BASS: Press or to adjust the bass sound.
TREBLE: Press or to adjust the treble sound.
BALANCE: Press or to obtain an equal sound level from both speakers.

- 3** After the desired setting is adjusted, press MENU repeatedly until the menu screen is cleared.

To return BASS/TREBLE/BALANCE control adjustments to the factory preset levels Press CANCEL while making sound adjustments.

Setting the StableSound®

The StableSound feature limits the highest volume level to prevent extreme changes in volume when the signal source is changed.

- 1** In the left step 2, press or to select "STABLE SOUND", then press or to select ON or OFF.



Setting the surround sound

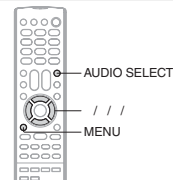
The dynamic presence and sound created offers a thoroughly enjoyable listening experience.

- 1** In the left step 2, press or to select "SURROUND", then press or to select ON or OFF.



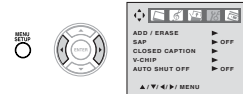
Stereo and Second Audio Program (SAP)

The unit is equipped with a feature known as multi-channel TV sound or MTS. MTS broadcasts greatly enhance TV viewing by bringing you programs with high-fidelity stereo sound. MTS also provides an extra channel called the Second Audio Program or SAP which broadcasters can use to transmit a second language for bilingual transmission or for other purposes.



Setting the SAP (analog mode)

- 1** Press MENU in the analog mode, then press or to select option.



- 2** Press or to select "SAP", then press or to select ON or OFF.



- 3** Press MENU repeatedly until the menu screen is cleared.

Listening to stereo sound

When the TV is turned on or a channel selection is made, the "STEREO" will appear on the screen. This means that Stereo broadcasting is available. You can enjoy stereo sound from the left and right speakers.

- When mono broadcasting is received, no indication is displayed.
- If the broadcast signal is not strong enough or clear stereo sound is not available, press AUDIO SELECT to change to mono sound. The noise should be eliminated. Press it again to return to the stereo sound.

STEREO CH 013

Listening to SAP (Second Audio Program)

When the TV is turned on or a channel selection is made, "SAP" will appear on the screen. This means that the Second Audio Program broadcasting is available.

STEREO SAP CH 013

To select desired sound

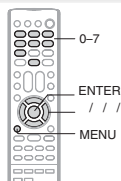
Press AUDIO SELECT to select the desired sound.



Broadcast	SAP setting	Audio display
MONO	OFF	MONO
STEREO	ON	STEREO MONO
MONO+SAP	OFF	STEREO MONO
STEREO+SAP	ON	SAP
	ON	STEREO MONO
	ON	SAP

TV operation

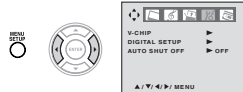
Setting the digital setup (digital mode)



Selecting the audio language

When two or more audio languages are included in a digital signal, you can select one of the audio languages.

- 1** Press MENU in the digital mode, then press or to select option.



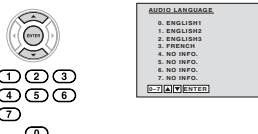
- 2** Press or to select "DIGITAL SETUP", then press .



- 3** Press or to select "AUDIO LANGUAGE", then press .



- 4** Press / or Number buttons (0-7) to select desired language, then press ENTER.



- 5** Press MENU repeatedly until the menu screen is cleared.



Checking the digital signal strength

You can check the strength of the digital signal by viewing the digital signal meter.

- 1** Follow the left steps 1-2.

- 2** Press or to select "SIGNAL METER", then press to check the digital signal strength.



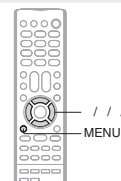
- 3** Press MENU repeatedly until the menu screen is cleared.



Notes:

- Signal meter feature is not available for analog channels.
- When you select a vacant channel, the signal meter may react.

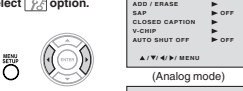
Using the auto shut off feature



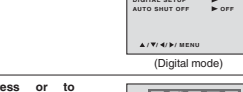
To use the auto shut off feature

In case of "AUTO SHUT OFF" is "ON", if a station being viewed stops broadcasting, the TV will automatically shut itself off after 15 minutes.

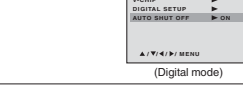
- 1** Press MENU, then press or to select option.



- 2** Press or to select "AUTO SHUT OFF", then press or to select "ON" or "OFF".



- 3** Press MENU repeatedly until the menu screen is cleared.



TV operation

Loading and unloading a cassette tape

Use only video cassette tapes marked **VHS**.

Loading

Push the center of the tape until it is automatically inserted.



Automatic power ON

When you insert a cassette tape, the unit power will turn ON automatically.

Automatic playback

When loading a cassette tape without an erase prevention tab, playback will start automatically.

Unloading

1 Press **STOP/EJECT** on the front panel or **EJECT** on the remote control.



2 Remove the cassette tape.



Automatic tape eject

This unit will automatically rewind the tape when the tape has ended. And when the tape is rewinded to its beginning, the cassette tape will be ejected automatically.

Notes:

- Always eject the tape when not in use.
- The cassette tape can be ejected even if the POWER is "OFF".

To prevent accidental erasure

To prevent accidental erasure

Remove the erase prevention tab with a screwdriver.



To record again

Cover the hole with a piece of adhesive tape.

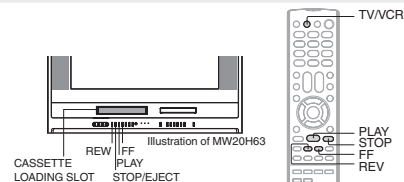


Tape speed and maximum recording time

Tape Speed	Video cassette tape				
	T-160	T-120	T-90	T-60	T-30
SP (Standard Play)	2-2/3 hours	2 hours	1-1/2 hours	1 hour	30 minutes
SLP (Super Long Play)	8 hours	6 hours	4-1/2 hours	3 hours	1-1/2 hours

Cassette tape playback

To play a prerecorded tape.



Playback

1 Load a pre-recorded tape:

(When loading a cassette tape without the erase prevention tab, playback will start automatically).



2 To start playback:

Press **PLAY** on the front panel or on the remote. Playback will start. " " will appear on the screen for about 4 seconds.



To stop playback:

Press **STOP/EJECT** once on the front panel or press **STOP** on the remote. The tape will stop but remain fully loaded and ready to play. " " will appear on the screen for about 4 seconds.



Notes:

- If you play a prerecorded tape after the DVD playback, you must set the unit to TV/VCR mode using the **TV/VCR** button.
- This unit selects the playback tape speed SP or SLP automatically.
- When you select the TV/VCR mode during DVD playback, DVD playback will change to the still mode, and after 5 minutes it will change to the resuming playback mode automatically.

Rewind or forward the tape

Stop the playback or recording with **STOP**.

To rewind the tape:

Press **REW** on the front panel or press **REW** on the remote control.



To forward the tape:

Press **FF** on the front panel or press **FF** on the remote control.

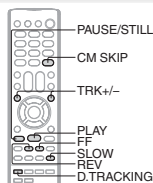


To stop the tape-winding, press **STOP**. To switch to playback directly (without **STOP**), press **PLAY**.

Forward/Reverse picture search mode

When the tape is being wound, you can switch to picture search mode (ED). To do this, press **REW** or **FF** again and hold it down. The unit will resume the tape winding as soon as the button is released.

Special playback



Picture search

Reverse picture search function

Press **REV** once or twice during the playback.

Forward picture search function

Press **FF** once or twice during the playback.

To return to playback, press **PLAY**.

SPEED SEARCH TIMES

TAPE SPEED	PICTURE SEARCH SPEED	
	PRESS ONCE	PRESS
SP (Standard Play)	3 X	5 X
SLP (Super Long Play)	9 X	15 X

Still picture

Press **PAUSE/STILL** during playback.

To resume normal playback, press **PLAY** or **PAUSE/STILL**. If the still picture jitters excessively, press **TRK + / -** to stabilize the still picture.

Slow motion

During playback press **SLOW**.

To return to playback, press **PLAY**.

Slow tracking and vertical lock adjustment

If noise bars appear in the picture during slow motion, press the **TRK + / -** to reduce the noise bars.

Frame by frame picture

Press **PAUSE/STILL** during playback.

Press **SLOW** one by one. The picture advances frame by frame.

To return to playback, press **PLAY** or **PAUSE/STILL**.

CM skip

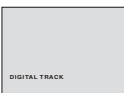
Press **CM SKIP** during playback. The unit will search forward through approximately 30 seconds of the tape (e.g. unwanted commercial time) for each press of **CM SKIP** (maximum six presses) and then resume normal playback.

For example : 1 press: 30 seconds of tape
2 press: 60 seconds of tape
3 press: 90 seconds of tape

Digital tracking controls

When a tape is played, the Digital Auto Tracking system automatically adjusts the tracking to obtain the best possible picture. If noise bars appear during playback, adjust the tracking manually as follows:

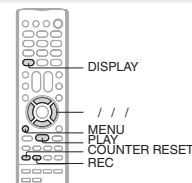
- Press **TRK + / -** to obtain the best possible picture. "MANUAL TRACK" will appear for 4 seconds on the screen. To resume automatic tracking, press **D.TRACKING**. "DIGITAL TRACK" will appear for 4 seconds on the screen.



Notes:

- "SP" is more appropriate as less noise appeared during search and still playback for tape recorded in SP.
- The audio output is muted during PICTURE SEARCH, STILL, FRAME ADVANCE and SLOW MOTION.
- During picture search mode there will be noise bars which are caused by the system.
- The Special Playback will automatically change to playback after approx. 5 minutes to protect the video tape against excessive wear.

Convenient function



Repeat playback

The entire video tape will be played until its end. The tape will automatically rewind to the beginning and the playback will be repeated.

1 Press **MENU**, then press or to select option.



2 Press or to select "AUTO REPEAT".



3 Press or to select "ON" or "OFF".

If "ON" is selected, the playback will be repeated endlessly.



4 Press **MENU** repeatedly until the menu screen is cleared.



5 To start the playback, press **PLAY**.

The playback will be repeated endlessly.

To cancel repeat mode:

In step 3 above, press or to select "OFF" position. Press **MENU** repeatedly until the menu screen is cleared. The repeat function is canceled automatically when the unit is switched off.

Using the real time tape counter

The on-screen real time tape counter shows the tape running time in hours, minutes and seconds. You can easily determine how long the tape has been running or how much time is left on the tape.

1 Press **DISPLAY**.



2 Press **COUNTER RESET** to set the counter to "00:00:00".



3 Begin Playback or Recording to start the tape, the counter will display the elapsed time.



4 When you wish to make the counter disappear, press **DISPLAY** once again.

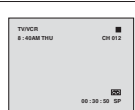


Convenient function (Continued)

Zero return function

The zero return function provides a convenient method of rapidly returning to the starting point of recording or playback. The starting point can be indexed for any location on the tape by pressing COUNTER RESET.

1 Press DISPLAY.



2 Before playback or recording, press COUNTER RESET to set the counter to "00:00:00".



3 Begin playback or recording.



4 Press STOP.



5 Press ZERO RETURN. The tape will rewind and automatically stop at the "00:00:00" position.



Video head cleaning

Video head clogging

The video heads are the means by which the unit reads the picture from the tape during playback. In the unlikely event that the heads become dirty enough to be clogged, no picture will be played back. This can easily be determined if, during playback of a known good tape, there is good sound, but no picture (picture is extremely snowy). If this is the case, the unit needs to be checked and cleaned by the qualified service personnel.



Good Picture



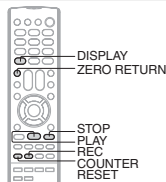
Snowy Picture

Video head cleaning

Video head cleaning is needed when the playback picture becomes unclear. This signifies that the heads are getting dirty and can occur when playing poor quality or damaged tapes. If the heads require cleaning, use an equivalent high quality chemical non-abrasive (wet) head cleaning tape or have them cleaned professionally. If playing a head cleaning tape in the unit once does not improve the picture, play it several times before requesting service.

Notes:

- DO NOT ATTEMPT TO CLEAN THE VIDEO HEADS OR SERVICE THE UNIT BY REMOVING THE REAR COVER.
- Video heads may eventually wear out and should be replaced when they fail to produce clear pictures.
- To help prevent video head clogging, use only good quality VHS tapes. Discard worn out tapes.



Recording a TV program

Recording and viewing the same TV program.

Recording a TV program

1 Load a cassette tape with the erase prevention tab intact.

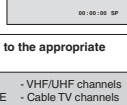


The unit will automatically turn on.

2 Press SPEED to select the desired tape speed SP or SLP.



The tape counter and SP or SLP will appear on the screen for about 4 seconds.



3 Select "TV" or "CABLE" to the appropriate position.



TV - VHF/UHF channels
CABLE - Cable TV channels

4 Press Direct channel selection (0-9, CH) to select the channel to be recorded.

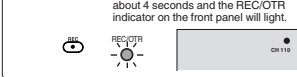


CH 110

5 Press REC.

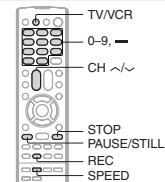


REC/OTR indicator on the front panel will light.



Notes:

- If power is switched off during recording, the TV and the VCR sections go off and the VCR continues to record.
- Press the STOP button to halt the recording and turn off the VCR.
- The unit channel cannot be changed during recording.
- If you record the TV program after the DVD playback, you must set the unit to TV/VCR mode using the TV/VCR button.



To stop recording

1 Press STOP to stop recording.

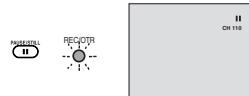
* will appear on screen for about 4 seconds.



To stop recording temporarily

Press PAUSE/STILL to avoid recording unwanted material.

will appear on the screen and the REC/OTR indicator will blink on and off. Press PAUSE/STILL or REC to continue the recording.



Note:

The pause function will be released after 5 minutes to prevent damage to the tape or the unit. The unit will change to the STOP mode.

Auto Rewind feature

This VCR will automatically rewind the tape when the tape has ended (except during OTR and timer recording). It will also eject the tape.

Notes:

- If the erase prevention tab is removed, the tape will eject when REC button is pressed for recording.
- If the unit is recording (including REC/PAUSE), the closed caption in the DVD disc cannot be display in the DVD mode.

Recording (VCR)

One-touch Timer Recording (OTR)

The One-touch timer recording feature provides a simple and convenient way to make a timed recording.

One-touch timer recording (OTR)

Example: One-touch timer recording for 30 minutes.

1 Load a cassette tape with the erase prevention tab intact.

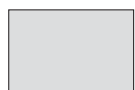


The unit will automatically turn on.

2 Press SPEED to select the desired tape speed SP or SLP.



The tape counter and SP or SLP will appear on the screen for about 4 seconds.



3 Select "TV" or "CABLE" to the appropriate position.



TV - VHF/UHF channels
CABLE - Cable TV channels

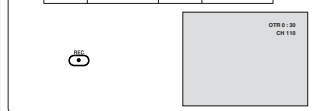
4 Press Direct channel selection (0-9, CH) to select the channel to be recorded.



CH 110

5 Press REC to begin recording. Press the button again to stop recording after 30 minutes. Each additional press of REC will increase recording time as shown below, up to a maximum of 6 hours. "OTR" will appear on the screen.

Press	Recording time	Press	Recording time
once	NORMAL REC	6 times	3:00
twice	0:30	7 times	4:00
3 times	1:00	8 times	5:00
4 times	1:30	9 times	6:00
5 times	2:00	10 times	NORMAL REC



To cancel OTR

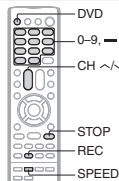
Press STOP



Notes:

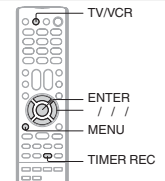
- If you wish to watch the DVD playback during the recording or the OTR, press DVD to change to DVD mode and perform the DVD playback.
- The channel cannot be changed during recording.

The unauthorized recording, use, distribution, or revision of television programs, videotapes, DVDs and other materials, is prohibited under the Copyright Laws of the United States and other countries, and may subject you to civil and/or criminal liability.



Timer recording

Timer recording can be programmed on-screen with the remote control. The built-in timer allows automatic unattended recording of up to 8 programs within 1 month.



Timer recording

Preparation:

- Press TV/VCR to select the TV/VCR mode.
- Load a cassette tape with the erase prevention tab intact.
- Check the time and date are correct.

Example:

Program a timer recording for 23rd day, channel 25 - 001 (Digital Channel), 7:00 - 9:30 PM (Tape speed : SLP).

1 Press MENU, then press or to select option.



TIMER REC SET

2 Press or to select "TIMER REC SET", then press .



TIMER REC SET

3 Press or to select one of the program line, then press ENTER.



TIMER REC SET

4 Press or to select the date, then press .



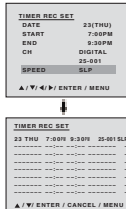
TIMER REC SET

5 Set the start time, end time, channel (Digital or Analog) and tape speed as in step 4. Then press ENTER.



Notes:

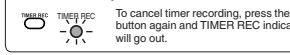
- Press to move cursor backward for correction.
- To record from external source set the channel to "L1" or "L2".



6 To set the timer for another program, repeat steps 3 to 5 to set another program.

7 Press TIMER REC. The TIMER REC indicator will light. The timer is programmed, when the programmed time is reached, the recording is automatically started.

To cancel timer recording, press the button again and TIMER REC indicator will go out.



Notes:

- The VCR section cannot be used while the TIMER REC indicator is lit. If you want to use the VCR operation, press TIMER REC to deactivate the timer.
- When the clock is not set, you cannot select "TIMER REC SET". In this case, set the clock (B) and reprogram any timer recordings.
- After a power failure or disconnection of the power plug, all programmed recording setting and time display will be lost upon resumption of power. In this case, reset the clock (B) and reprogram any timer recordings.
- If you want to correct the digits while setting, press or until the item you want to correct, then press or to correct the desired setting.
- If programming is performed without a tape in the unit, or with a tape without an erase prevention tab, the Timer Recording is not possible. If a tape without an erase prevention tab is in the unit, the tape will be ejected.

Recording (VCR)

Playing a disc (Continued)

Basic playback

To pause playback (still mode)

Press **PAUSE/STILL** during playback.



To resume normal playback, press **PLAY**.
• The sound is muted during still mode.



To stop playback

Press **STOP**.



To remove the disc

Press **OPEN/CLOSE**.



Remove the disc after the disc tray opens completely.



Be sure to press **OPEN/CLOSE** to close the disc tray after you remove the disc.

Notes:

- If a non-compatible disc is loaded, "Incorrect Disc", "Region Code Error" or "Parental Error" will appear on the TV screen according to the type of loaded disc. In this case, check your disc again (see pages 53 and 54).
- Some discs may take a minute or so to start playback.
- When you set a single-faced disc label downwards (i.e. the wrong way up) and press **OPEN/CLOSE** or **PLAY** on the unit, "Reading" will appear on the display for a few minutes and then "Incorrect Disc" will continue to be displayed.
- Some discs may not work the resuming facility.
- Resuming cannot function when you play a PBC-featured Video CD while the PBC is on. See "To turn off the PBC" (54).
- Some playback operations of DVDs may be intentionally fixed by software producers. Since this unit plays DVDs according to the disc contents the software producers designed, some playback features may not be available. Also refer to the instructions supplied with the DVDs.
- Do not move the unit during playback. Doing so may damage the disc.
- Use **OPEN/CLOSE** to open and close the disc tray. Do not push the disc tray while it is moving. Doing so may cause the unit to malfunction.
- Do not push up on the disc tray or put any objects other than discs on the disc tray. Doing so may cause the unit to malfunction.
- In many instances, a menu screen will appear after playback of a movie is completed. Prolonged display of an on-screen menu may damage your television set, permanently etching that image onto its screen. To avoid this, be sure to press **POWER** on your remote control once the movie is completed.
- There may be a slight delay between the button is pressed and the function activates.
- If the unit is not recording, the closed caption in the DVD disc can be displayed in the DVD mode.

To obtain a higher quality picture

Occasionally, some picture noise not usually visible on the TV screen during a normal broadcast may appear while playing a DVD video disc. It is because due to high resolution pictures on these discs which include a lot of information. The amount of noise depends on the disc you use with this unit. You should generally reduce the sharpness adjustment on your TV when viewing DVD video discs.

About icons

The icons on the heading bar show the playable discs for the function described under that heading.

: You can use this function with DVD video discs.

: You can use this function with Video CDs.

: You can use this function with Audio CDs and CD-R/RW CDs.

Zooming/Locating desired scene

Zooming

This unit will allow you to zoom in on the frame image. You can then make selections by switching the position of the frame.

1 Press ZOOM during playback.



The center part of the image will be zoomed in.
Each press of **ZOOM** will change at different part of the frame.
ZOOM Q.1 (x 1.3), Q.2 (x 1.5) and Q.3 (x 2.0).



2 Press frame.



You may move the frame from the center position to UP, DOWN, LEFT or RIGHT direction.



3 In the zoom mode, press ZOOM repeatedly to return to a 1:1 view (Q. Off).



Notes:

- You can select the Pause, Slow or Search playback in the zoom mode.
- Some discs may not respond to zoom feature.

Locating desired scene

Use the title, chapter and time recorded on the DVD disc to locate the desired point to playback. In the case of VCD/Audio CD disc, time and track are used to locate the desired point to playback.

To check the title, chapter/track and time, press **DISPLAY**.

1 Press JUMP during playback or resume stop



to resume stop mode.



Jump



Title Chapter Time



Jump



Title Chapter Time



Jump



Title Chapter Time



Jump



Title Chapter Time



Jump



Title Chapter Time



Jump



Title Chapter Time



Jump



Title Chapter Time



Jump



Title Chapter Time



Jump



Title Chapter Time



Jump



Title Chapter Time



Jump



Title Chapter Time



Jump



Title Chapter Time



Jump



Title Chapter Time



Jump



Title Chapter Time



Jump



Title Chapter Time



Jump

Notes:

- In case of the Audio CD and Video-CD, only Track and Time can be selected.
- In case of the Video-CD playback with PBC, the JUMP does not work. See "To turn off the PBC" (54).

Playing in fast reverse or fast forward directions

Press REV or FF during playback.



REV: Fast reverse playback
FF: Fast forward playback

Each time you press **REV** or **FF**, the playback speed changes.

To resume normal playback

Press **PLAY**.



Notes:

- The unit mutes sound during reverse and forward scan of DVD/VCD video discs.
- The playback speed may differ depending on the disc.

Playing frame by frame

Press PAUSE/STILL during still playback.



Each time you press **PAUSE/STILL**, the picture advances one frame.

To resume normal playback

Press **PLAY**.



Notes:

- The sound is muted during frame by frame playback.

Playing in slow-motion

Press SLOW during playback.



Each time you press **SLOW**, the slow-motion speed changes.

To resume normal playback

Press **PLAY**.



Notes:

- The sound is muted during slow-motion playback.

Locating a chapter or track

Press SKIP repeatedly to display the chapter or track number you want.

Playback starts from the selected chapter or track.



To locate succeeding chapters or tracks.



Playback starts from the beginning of the current chapter or track. When you press twice in quick succession, playback starts from the beginning of the preceding chapter or track.

Note:

Press and hold **SKIP** on the unit during playback to play forward or reverse. Afterwards, each time you press and hold **SKIP**, the playback speed will change.

Notes:

- A prohibition symbol "X" may appear at the upper right of the screen. This symbol means either the feature you tried is not available on the disc, or the unit cannot access the feature at this time. This does not indicate a problem with the unit.
- The unit is capable of holding a still video image or On screen display image on your television screen indefinitely. If you leave the still video image or On screen display image displayed on your TV for an extended period of time, you risk permanent damage to your television screen. Projection televisions are very susceptible.

Repeat playback/A-B Repeat playback

Repeat playback

1 Press PLAY mode during playback or stop mode.



2 [DVD] Press ENTER repeatedly to select "Chapter" or "Title".



The unit automatically starts repeat playback after finishing the current title or chapter.



Play Mode Repeat : Off



[Video CD] Press to select "Repeat". Press ENTER repeatedly to select "Track" or "All".



The unit automatically starts repeat playback after finishing the current track.



Play Mode Repeat : Off



Play Mode Repeat : Off



Play Mode Repeat : Off



Play Mode Repeat : Off



Play Mode Repeat : Off



Play Mode Repeat : Off



Play Mode Repeat : Off



Play Mode Repeat : Off



Play Mode Repeat : Off



Play Mode Repeat : Off



Play Mode Repeat : Off



Play Mode Repeat : Off



Play Mode Repeat : Off



Play Mode Repeat : Off



Play Mode Repeat : Off



Play Mode Repeat : Off

Notes:

- Some discs may not work with the repeat operation.
- In case of Video CD with PBC, Repeat function is prohibited during playback.
- Chapter/Track repeat function is canceled whenever **SKIP** is pressed.

To resume normal playback

Select Repeat : "Off" in step 2.

A-B Repeat playback

A-B repeat playback allows you to repeat a section between two selected points.

1 Press REPEAT A-B during playback.

The start point is selected.



2 Press REPEAT A-B again.

The end point is selected. Playback starts at the point that you selected. Playback stops at the end point and returns to Point A automatically, then starts again.



To resume normal playback

Press REPEAT A-B again.

"Off" appears on the screen.

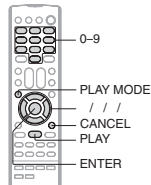
Notes:

- In A-B Repeat mode, subtitles near the A or B locations may not be displayed.
- You cannot set the A-B Repeat for the scenes that include multiple angles.
- A-B Repeat playback does not work when Repeat playback is activated.
- You may not be able to set A-B Repeat during certain scenes of the DVD, MP3/WMA/JPEG CD.
- A-B Repeat does not work with an interactive DVD.
- In case of Video CD with PBC, A-B Repeat is prohibited.

Program playback/Random playback

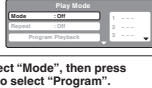
You can arrange the playback order of tracks on the disc. And the unit can also select tracks at random and playback them. These feature works for Video CD.

For Audio CD and MP3/WMA CD, please see "Random playback (CD)" (E3) and "Program playback (CD)" (E3).

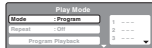


Program playback

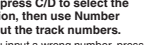
1 Press PLAY MODE in the stop mode.



2 Press / and then use Number buttons (0-9) to input the track numbers.



3 Press / to select the right column. Press / and then use Number buttons (0-9) to input the track numbers.

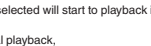


To program others, press C/D to select the programming position, then use Number buttons (0-9) to input the track numbers.

- If you input a wrong number, press CANCEL.



4 Press / to return to the left column, then press / to select the "Program Playback" and press ENTER.



The programs you selected will start to playback in order.

- To resume normal playback, select Mode: "Off" in step 2.

To change the program

1. Select Mode to "Program" (as step 2), press / to select the right column, then press / to select the track number you want to change, then press CANCEL.
2. Press Number buttons (0-9) to input the new track number.

To clear the program one by one

1. Select Mode to "Program", press / to select the right column, then press / to select the track number. Then press CANCEL.

To clear all the programs

1. At the left column, press / to select "Clear Program". Then press ENTER.

Notes:

- In playing back the Video CD with PBC, you cannot set Program playback.
- The program is canceled when you open the disc tray or turn the power off.

Random playback

1 Press PLAY MODE in the stop mode.



2 Press / to select "Mode", then press ENTER repeatedly to select "Random".



3 Press PLAY.



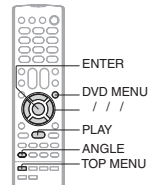
The Random Playback will start.

- If you set "Random" during playback mode, Random playback will begin after the track that is currently being played has ended.
- To resume normal playback, select Mode: "Off" in step 2.

Notes:

- In case of the Video CD with PBC, you cannot set Random playback.

Changing angles/Title selection/DVD menu



Changing angles

When playing back a disc recorded with multi-angle facility, you can change the angle that you are viewing the scene from.

1 Press ANGLE during playback.



The current angle will appear.



2 Press ANGLE repeatedly until the desired angle is selected.



Note:

Depending on the DVD, you may not be able to change the angles even if multi-angles are recorded on the DVD.

Title selection

Two or more titles are recorded on some discs. If the title menu is recorded on the disc, you can select the desired title.

1 Press TOP MENU during playback.



The menu appears on the screen.



To select the desired title.

3 Press ENTER or PLAY.



The playback of the selected title will start.

Note:

Depending on the DVD, you may not be able to select the title. Depending on the DVD, a "title menu" may simply be called a "menu" or "title" in the instructions supplied with the disc.

DVD menu

Some DVDs allow you to select the disc contents using the menu.

When you playback these DVDs, you can select the subtitle language and soundtrack language, etc. using the menu.

1 Press DVD MENU during playback.



The DVD menu appears on the screen.

- Press DVD MENU again to resume playback at the scene when you pressed DVD MENU.



To select the desired item.

3 Press ENTER.

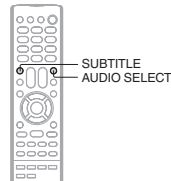


The menu continues to another screen. Repeat steps 2 and 3 to set the item completely.

Note:

Depending on the DVD, you may not be able to resume playback from the scene point when you press DVD MENU.

Changing soundtrack language/ Subtitles



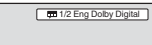
Changing soundtrack language

You can select the language when you play a multilingual disc.

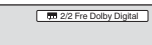
1 Press AUDIO SELECT during playback



The current soundtrack language will appear.



2 Press / or to select "Mode", then press ENTER repeatedly to select "Program".



- The on screen display will disappear after a few seconds.

In case of Video CD playback

Audio type changes as follows each time you press AUDIO SELECT.



Notes:

- If the desired language is not heard after pressing the button several times, the language is not recorded on the disc.
- The selected soundtrack language is canceled when you open the disc tray. The initial default language or available language will be heard if the disc is played back again.
- If you select DTS in playing DTS-encoded disc, no sound will be heard from the unit's speakers.

Subtitles

When playing back a disc recorded with subtitles, you can select the subtitle language or turn the subtitle off.

1 Press SUBTITLE repeatedly during playback until the desired language is selected.



2 To turn off the subtitle, press subtitle until "Off" appears.

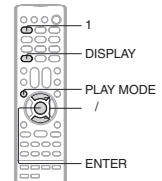


- The on screen display will disappear after a few seconds.

Notes:

- Depending on the DVD, you may not be able to change subtitles, or to turn subtitles on or off.
- While playing a DVD, the subtitle may change when you open or close the disc tray.
- In some cases, a selected subtitle language may not be changed immediately.

Disc status/To turn off the PBC

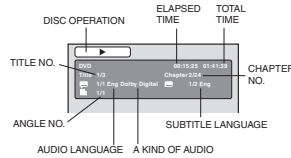


Disc status

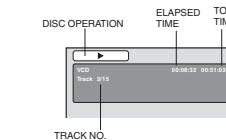
With press of DISPLAY, the status of the disc will appear on the screen. To cancel the display, press DISPLAY again.



DVD



Video CD



To turn off the PBC

1 Press PLAY MODE in the stop mode.



2 Press / to select "Mode", then press ENTER to select "Off".



3 Press PLAY MODE again to clear the screen.

To turn on the PBC Follow the above steps 1~2, then press ENTER repeatedly until "PBC" appear.

Note:

You can also turn off the PBC by pressing number button 1 and ENTER in the stop mode.

MP3/WMA/JPEG/DivX® and Audio CD operation

This player can playback the MP3/WMA/JPEG/DivX® data which has been recorded on CD-R/RW. Audio CD also can be played back. To produce the MP3/WMA/JPEG/DivX® data, you need a Windows-PC with CD-RW drive and a MP3/WMA/JPEG/DivX® encoding Software (not supplied). The Apple-HFS-System cannot be played.

This player requires discs/recordings to meet certain technical standards in order to achieve optimal playback quality. There are many different types of recordable disc formats (including CD-R containing MP3/WMA files). Not all recordable discs will produce optimal playback quality. The technical criteria set forth in this owner's manual are meant only as a guide. Use of CD-RW for MP3 files is not recommended.

You must obtain any required permission from copyright owners to download or use copyrighted content. Toshiba cannot and does not grant such permission.

MP3/WMA/JPEG/DivX® - data information

Limitations on MP3/WMA/JPEG/DivX® playback

- MP3/WMA/JPEG/DivX® CD are standardized by ISO9660, its file name must include following extensions; ".mp3", ".wma", ".jpg", ".div", ".avi", ".wmv".
- MP3/WMA/JPEG/DivX® CD must be corresponded to the ISO standardized files.
- This unit can read 600 files per directory. If one directory has more than 600 files, the remaining files will be omitted.
- The unit is able to recognize up to a maximum of 50 directories per disc.
- MP3/WMA/JPEG/DivX® CDs cannot be used for the purpose of recording on this unit.
- If the CD has both CDA audio tracks and MP3/WMA/JPEG/DivX® files, only the CDA audio tracks will be played.
- It may take more than one minute for this unit to read MP3/WMA/JPEG/DivX® files depending on its structure.
- Music recorded by "Joliet Recording Specification" can be played back.
- The music files recorded by "Hierarchical File System" (HFS) cannot be played.

Limitations on displaying of the file name.

- The maximum number for display is 15 characters. Long file names will be condensed.
- Available characters for display are the following: capital or small alphabets of A through Z, numbers of 0 through 9, and _ (under score).
- Other characters than those above are replaced in hyphen.

To playback MP3/WMA/JPEG/DivX® CD in the recorded order.

- Use MP3/WMA/JPEG/DivX® software that records data alphabetically or numerically.
- Insert two or three digit number in the head of file name. (ex. "01" "02" or "001" "002").
- Refrain from making too many sub-folders.

CAUTION:

- Some MP3/WMA/JPEG/DivX® CDs cannot be played back depending on the recording conditions.
- The CD-R/RW that has no music data or non MP3/WMA/JPEG/DivX® files cannot be played back.

Standard sampling frequency and the bit rate:

MP3

MPEG-1 Audio
32kHz, 44.1kHz, 48kHz
32kbps ~ 320kbps (constant bit rate or variable bit rate)
The recommend recording setting for a high-quality sound is 44.1kHz of sampling frequency and 128kbps of constant bit rate.

WMA

WMA version 7 and 8
32kHz/48kbps, 44.1kHz/48kbps~192kbps, 48kHz/128kbps~192kbps
The file recorded by mono, 48kHz, 48 kbps is not available to this unit.

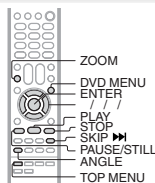
DivX® video

DivX® version: DivX® 3, 4, 5, and 6 (specifically 3.1.1, 4.1.2, 5.0.2, 5.0.5, 5.1.1, 5.2.1, 6.0 at Home Theater profile).
Audio format: MPEG1 Layer2 (MP2), MPEG1 Layer3 (MP3)
Sampling frequencies: 32kHz, 44.1kHz, 48kHz
Bit rate: 32kbps ~ 320kbps
Resolution: Max 720 x 576 (at 25fps), Max 720 x 480 (at 30fps)

Microsoft, Windows Media, and Windows Logo are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

DivX, DivX Certified, and associated logos are trademarks of DivX, Inc. and are used under license.

MP3/WMA/JPEG/DivX® and Audio CD operation (Continued)



JPEG playback

- In the file browser, press **ENTER** / **STOP** to select the desired JPEG file. To display a thumbnail list, press **DVD MENU**. Press **ENTER** (To return to the file browser, press **TOP MENU**.)



When **PLAY** is pressed after displaying the file browser, or when the disc tray is closed by pressing **PLAY**, playback begins automatically starting from the first file. In this case, if the first file is a JPEG file, the first JPEG file is played back. If the first file is a DivX® file, the first DivX® file is played back. If the first file is an MP3/WMA file, only MP3/WMA files are played back in order. If there is no file at a root directory, playback does not begin automatically.

- Press **ENTER**. The selected picture appears on the screen.



Rotating an image
You can rotate an image by 90 degrees. Press **ANGLE** during playback of the image.

• **ANGLE** appears on the screen.

Zooming an image
Zoom function also can be used in viewing JPEG files. Press **ZOOM** (See "Zooming" 64).

- Press **STOP** to end playback.



The file browser appears on the screen. If you want to watch the other file, repeat steps 1 ~ 2.

Slide show playback

The slide show enables you to view pictures (files) one after another automatically.

Preparation:
Set "JPEG Interval" setting to "5 Seconds", "10 Seconds" or "15 Seconds" (64).

- Select your desired starting file for the slide show in step 1 on the left.

- Press **ENTER** or **PLAY** to start slide show from the selected file.



- If you press **PAUSE/STILL** during the slide show, the slide show stops temporarily. "H" appears briefly on the screen.
- If the picture appears upside down or sideways, press **ANGLE** repeatedly until it's right side up.
- **ANGLE** appears on the screen.
- Press **PLAY** or **SKIP** again to resume the slide show.
- When the slide show playback finished, the file list appears.
- To stop the slide show, press **STOP**. The file list appears.

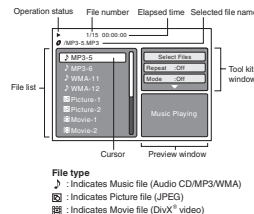
Note:
During JPEG playback, you cannot use Jump and A-B Repeat functions.

Loading CD

- Place a MP3/WMA/JPEG/DivX® CD or an Audio CD onto the disc tray, then press **OPEN/CLOSE**.



- A file browser screen will appear on the screen.



- In case the current directory includes 9 files or more, press **ENTER** or **STOP** to scroll in the file list.
- To see contents in folder, select the folder and then press **ENTER**. To return to the parent directory, select **Go Up** ... then press **ENTER**.
- In case of a CD containing a mixture of MP3, WMA, JPEG and DivX® files, the files are played back by selecting them from the file browser.

MP3/WMA and Audio CD playback

- In the file browser, press **ENTER** / **STOP** to select the desired file.



When **PLAY** is pressed after displaying file browser displayed, or when the disc tray is closed by pressing **PLAY**, playback begins automatically starting from the first file. In this case, if the first file is an MP3/WMA file, only MP3/WMA files are played back in order. If the first file is a JPEG file, the first JPEG file is played back. If the first file is a DivX® file, the first DivX® file is played back. If there is no file at a root directory, playback does not begin automatically.

- Press **ENTER**.



The selected file starts playing back.

- Press **STOP** to end playback.



The selected file starts playing back.

- The unit records the stopped point. "H" appears on the screen. Press **PLAY** to resume playback (from the scene point).
- If you press **STOP** again or unload the disc, the unit will clear the stopped point.

Notes:

- MP3 or WMA file on the Kodak Picture CD is not recognized on this unit.
- During MP3/WMA/JPEG/DivX® Playback, you cannot use JUMP and A-B Repeat functions.
- You can use Repeat (Track or All), Random functions and Program playback for MP3/WMA/JPEG/DivX® Playback (64, 65).

Select Files

The file type to make it display in the file browser can be chosen.

- Press **ENTER** or select "Select Files" at right column in the file browser.

- Press **ENTER**, then press **ENTER** or to select file type from the list (Music, Picture or Movie).

- Press **ENTER** to add/remove check mark. Checked file type will be displayed in the file browser.
- Press **RETURN** to save the setting.

MP3/WMA/JPEG/DivX® and Audio CD operation (Continued)

JPEG playback

- In the file browser, press **ENTER** / **STOP** to select the desired JPEG file. To display a thumbnail list, press **DVD MENU**. Press **ENTER** (To return to the file browser, press **TOP MENU**.)



When **PLAY** is pressed after displaying the file browser, or when the disc tray is closed by pressing **PLAY**, playback begins automatically starting from the first file. In this case, if the first file is a JPEG file, the first JPEG file is played back. If the first file is a DivX® file, the first DivX® file is played back. If the first file is an MP3/WMA file, only MP3/WMA files are played back in order. If there is no file at a root directory, playback does not begin automatically.

- Press **ENTER**. The selected picture appears on the screen.



Rotating an image
You can rotate an image by 90 degrees. Press **ANGLE** during playback of the image.

• **ANGLE** appears on the screen.

Zooming an image
Zoom function also can be used in viewing JPEG files. Press **ZOOM** (See "Zooming" 64).

- Press **STOP** to end playback.



The file browser appears on the screen. If you want to watch the other file, repeat steps 1 ~ 2.

Slide show playback

The slide show enables you to view pictures (files) one after another automatically.

Preparation:
Set "JPEG Interval" setting to "5 Seconds", "10 Seconds" or "15 Seconds" (64).

- Select your desired starting file for the slide show in step 1 on the left.

- Press **ENTER** or **PLAY** to start slide show from the selected file.



- If you press **PAUSE/STILL** during the slide show, the slide show stops temporarily. "H" appears briefly on the screen.
- If the picture appears upside down or sideways, press **ANGLE** repeatedly until it's right side up.
- **ANGLE** appears on the screen.
- Press **PLAY** or **SKIP** again to resume the slide show.
- When the slide show playback finished, the file list appears.
- To stop the slide show, press **STOP**. The file list appears.

Note:
During JPEG playback, you cannot use Jump and A-B Repeat functions.

DivX® playback

- Press **ENTER** / **STOP** to select desired DivX® file.



When **PLAY** has been pressed after displaying the file browser, or when the disc tray has been closed after pressing **PLAY**, playback begins automatically starting from the first file. In this case, if the first file is a JPEG file, the first JPEG file is played back. If the first file is a DivX® file, the first DivX® file is played back. If the first file is an MP3/WMA file, only MP3/WMA file are played back in order. If there is no file at a root directory, playback does not begin automatically.

- Press **ENTER** or **PLAY**. The selected DivX® movie will be played back on the screen.



- Press **STOP** to end playback.



The file browser appears on the screen. If you want to watch the other file, repeat steps 1 ~ 2.

Playing DivX® VOD content

DivX® VOD content is protected by DRM (Digital Rights Management) system. This restricts playback of content to specific registered devices.

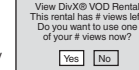
If the incorrect DRM file is loaded, "Authorization Error This player is not authorized to play this video." will appear on the screen.

When you attempt to play DivX® VOD, the number of plays is limited and the right message will appear on the screen. If you wish to play it, select "Yes".

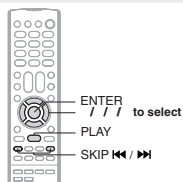
- If the number of plays goes over the limit, then "Rental Expired" will be displayed. In this case the file will not be played.

Note:

In order to play DivX® VOD content on this unit, you first need to register the unit with registration code. See page 62.



MP3/WMA/JPEG/DivX® and Audio CD operation (Continued)



Repeat playback (CD)

- In the file browser, press "Repeat" during stop mode.
- Press ENTER repeatedly to select "Track" or "All".
- Press PLAY. The unit automatically starts repeat playback after finishing the current track.

To resume normal playback
Select Repeat : "Off" in step 2.

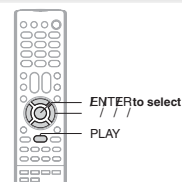
Notes:

- The repeat or random function is canceled when you open the disc tray or turn the power off.
- The track repeat function is canceled when SKIP or is pressed.
- In case of Audio CD, the function of A-B Repeat can be used to select repeat playback.

Random playback (CD)

- In the file browser, press "Mode" during stop mode.
- Press ENTER to select "Random".
- Press PLAY. The Random playback will start.

To resume normal playback
Select Repeat : "Off" in step 2.



Program playback (CD)

- In the file browser, press "Edit Mode", then press ENTER.
- Press add into the program list.
- Press Then press ENTER. All marked files are added into the program list.
- Press / to select "Program View", then press ENTER. Program View shows only the programmed files that you have added in Step 2.

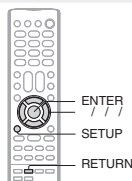
To remove file from program list in stop mode
In the Edit Mode, switch to Program View. Select the files you want to remove, then press ENTER. Select "Clear Program" and press ENTER. Marked file is removed from program list.

Note:

The program function is canceled when you eject the disc or turn the power off.

Customizing the function settings

You can change the default settings to customize performance to your preference.



Setting procedure


- Press SETUP during stop mode. The following on-screen display appears.
- Press or press to select the desired section, then press or press to select the desired option.
- First option will be highlighted. Press or to select the desired option.
- Then press or ENTER. The selectable setting will appear.
- Change the selection using or by referring to the corresponding pages (68-70). Press ENTER to save the setting.
- To clear SETUP screen, press SETUP or RETURN.

Setting details

Section	Option	Details	Page
	Menu	To select the language of "Menu", "Subtitle" and "Audio" if more than one language are available on the disc.	68
	Subtitle		
	TV Screen	To select a picture size according to the aspect ratio of your TV.	68
	Display	To turn on or OFF the operational status display on the screen.	68
	Picture Mode	To select a preferred picture mode from "Video", "Film" or "Auto".	69
	JPEG Interval	To select a preferred setting for the slide show playback.	69
	DRC	To select On or Off for DRC (Dynamic Range Control).	69
	Parental	To select a preferred parental level for the parental setting.	70
	Password	To change the password.	
	DivX(R) VOD	To display your 8-character registration code.	

Customizing the function settings (Continued)

Setting details



Menu, Subtitle, Audio

You can select the language of "Menu", "Subtitle" and "Audio" if more than one languages are recorded onto the disc.

English, Français, Español:
The selected language will be heard or seen.


Other:
Other language can be selected (see "Language code list" (E2)).

Original (Audio):
The unit will select the first-priority language of each disc.

Off (Subtitle):
Subtitles do not appear.

Notes:

- If the selected language is not recorded on the disc, the first-priority language is selected.
- If you want to change the OSD language, you can perform it by TV MENU (E3).



TV Screen

You have the following screen sizes to choose from:

4:3 (Letter box):
Select this mode when connecting to a conventional TV. When playing back a wide screen-DVD disc, it displays the wide picture with black bands at the top and bottom of screen.

4:3 (Pan scan):
It displays the wide picture on the whole screen with left and right edges automatically cut off.

Press **OPEN/CLOSE** to view in the selected screen size.

Note:
If the DVD disc is not formatted in the Pan & scan style, it will display 4:3 style.

Display


On screen display can be switched on or off when you press any buttons.

On:
On screen displays appear when you press the buttons (factory setting).

Off:
On screen displays do not appear when you press any buttons.

Customizing the function settings (Continued)

Setting details



Parental control setting

Some discs are specified as not suitable for children. Such discs can be limited not to playback with the unit.

- Press or to select "Parental", then press **ENTER**. "Enter Password" screen will appear.
- Press "0000" using **Number buttons (0-9)**. (Please note, this is pre-setting password of this unit). Then press **ENTER**. The parental level list will appear.
 - Level Off:** The parental control setting does not function.
 - Level 8:** Virtually all DVD software can be played back.
 - Level 1:** DVD software for adults cannot be played back.
- Press or to select from the level 1 to level 8. The limitation will be more severe as the level number is lower. Then press **ENTER**.
- Press **OPEN/CLOSE** to activate Parental control setting.

Notes:

- The parental control level is equivalent to the following USA movie ratings.

Level 1: G	Level 5:
Level 2: PG	Level 6: R
Level 3: PG	Level 7: NC-17
Level 4: PG-13	Level 8:

The parental control levels for other countries/area than U.S. are included for future use. Check the appropriate parental control level when you buy a DVD video disc equipped with the parental control feature in the future.

- Depending on the discs, the unit cannot limit playback.
- Some discs may not be encoded with specific rating level information though its disc jacket says "adult." For those discs, the age restriction will not work.
- The password is required every time when you change the parental level.
- If you input a wrong number, press **CANCEL**.

Set the new password

- Press or to select "Password", then press **ENTER**. "Enter Current Password" screen will appear.
- Press **Number buttons (0-9)** to input the current password (If the password has not been set yet after you purchase this unit, it is "0000").
- Then press **ENTER**. "Enter New Password" screen will appear. Press **Number buttons (0-9)** to input the new password.
- Press **ENTER**. Now your new password has been set. Be sure to remember this number!

If you forget the password.

- Press **OPEN/CLOSE** to open the disc tray.
- Remove the disc.
- Press **OPEN/CLOSE** again to close the disc tray.
- "No Disc" appears on the screen.
- While holding 7 down on the remote control and at the same time press **STOP** on the front panel. "Password Clear" appears on the screen. Now the password has been returned to the initial value ("0000").

DivX® VOD

In order to play DivX® VOD (Video On Demand) content on this unit, you first need to register the unit with your DivX® VOD content provider. You do this by generating a DivX® VOD registration code, which you submit to your provider.

Press or to select "DivX(R) VOD". Then press **ENTER**. Your 8-character registration code is displayed. Make a note of the code as you will need it when you register with a DivX® VOD provider. Then press **ENTER**.

Note:
If each setup (pages (E3)-(E7)) has completed, the unit can always work under the same condition (especially with DVD discs).
Each setup will be retained in the memory even if you turn the power off.

Picture Mode

There are two types of source content in pictures recorded in DVD video discs: film content (pictures recorded from films at 24 frames per second) and video content (video signals recorded at 30 frames per second). Make this selection according to the type of content being viewed.

Auto: Select this selection normally. The DVD player automatically detects source content, film or video of playback source, and converts that signal in an appropriate method.

Film: The DVD player converts film content pictures appropriately. Suitable for playback of film content pictures.

Video: The DVD player filters video signal, and converts it appropriately. Suitable for playback of video content pictures.

Note:
Depending on the disc, pictures may be cut off or doubled. In this case, select "Video".

JPEG Interval

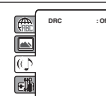
You can continuously playback all JPEG files automatically. After the selection below, the disc will start playback on JPEG files which have been recorded.

Off:
Plays back one file at a time.

5 Seconds:
Plays back images in the form of a slide show at 5 second intervals.

10 Seconds:
Plays back images in the form of a slide show at 10 second intervals.

15 Seconds:
Plays back images in the form of a slide show in 15 second intervals.



DRC

DRC (Dynamic Range Control) enables you to control the dynamic range so as to achieve a suitable sound for your equipment.

On: Loud sound such as explosion is toned down slightly when played back. This is suitable when it is connected to a stereo.

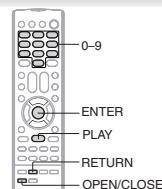
Off: It plays back at the recording level on the disc.

Notes:

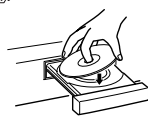
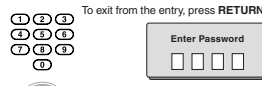
- This function works only during playback of Dolby Digital recorded discs.
- The level of Dynamic Range Reduction may differ depending on DVD video disc.

Temporary cancel the rating level by DVD disc


Depending on the DVD disc, the disc may try to temporarily cancel the rating level that you have set. It is up to you to decide whether to cancel the rating level or not.



Temporary cancel the rating level by DVD disc


- Load a DVD disc and press **PLAY** or **OPEN/CLOSE** on the unit (E5).
 
- If the DVD disc has been designed to temporarily cancel the Rating level, the screen which follows the "Reading" screen will change, depending on which disc is played. If you select "YES" with the **ENTER** key, password input screen will then appear.
 
- Enter the password with **Number buttons (0-9)**. Then press **ENTER**.

To exit from the entry, press **RETURN**.


- Playback will commence if the entered password was correct.

Note:
This temporary cancellation of rating level will be kept until the disc is ejected. When the disc is ejected, the original rating level will be set again automatically.

Language code list

Enter the appropriate code number for the initial settings "Menu", "Subtitle" and/or "Audio" .

Language	Name	Code	Language	Name	Code	Language	Name	Code	Language	Name	Code
Abkhazian		1112	Fiji		1620	Lingala		2224	Singhalese		2919
Afar		1111	Finnish		1619	Lithuanian		2230	Slovak		2921
Afrikaans		1116	French		1628	Macedonian		2321	Slovenian		2922
Albanian		2927	Frisian		1635	Malagasy		2317	Somali		2925
Amharic		1123	Galician		1722	Malay		2329	Spanish		1529
Arabic		1128	Georgian		2111	Malayalam		2322	Sundanese		2931
Armenian		1835	German		1415	Maltese		2330	Swahili		2933
Assamese		1129	Greek		1522	Maori		2319	Swedish		2932
Aymara		1135	Greenlandic		2122	Marathi		2328	Tagalog		3022
Azerbaijani		1136	Guarani		1724	Moldavian		2325	Tajik		3017
Bashkir		1211	Gujarati		1731	Mongolian		2324	Tamil		3011
Basque		1531	Hausa		1811	Nauru		2411	Tatar		3030
Bengali; Bangla		1224	Hebrew		1933	Nepali		2415	Telugu		3015
Bhutani		1436	Hindi		1819	Norwegian		2425	Thai		3018
Bihari		1218	Hungarian		1831	Oriya		2528	Tibetan		1225
Breton		1228	Icelandic		1929	Punjabi		2611	Tigrinya		3019
Bulgarian		1217	Indonesian		1924	Pashto Pushto		2629	Tonga		3025
Burmese		2335	Interlingua		1911	Persian		1611	Turkish		3028
Byelorussian		1215	Irish		1711	Polish		2622	Turkmen		3021
Cambodian		2123	Italian		1930	Portuguese		2630	Twi		3033
Catalan		1311	Japanese		2011	Quechua		2731	Ukrainian		3121
Chinese		3618	Javanese		2033	Rhaeto-Romance		2823	Urdu		3128
Corsican		1325	Kannada		2124	Romanian		2825	Uzbek		3136
Croatian		1828	Kashmiri		2129	Russian		2831	Vietnamese		3219
Czech		1329	Kazakh		2121	Samoan		2923	Volapük		3225
Danish		1411	Kirghiz		2135	Sanskrit		2911	Welsh		1335
Dutch		2422	Korean		2125	Scots Gaelic		1714	Wolof		3325
English		1524	Kurdish		2131	Serbian		2928	Xhosa		3418
Esperanto		1525	Laotian		2225	Serbo-Croatian		2918	Yiddish		2019
Estonian		1530	Latin		2211	Shona		2924	Yoruba		3525
Faroese		1625	Latvian Lettish		2232	Sindhi		2914	Zulu		3631

Reception disturbances

Most types of television interference can be remedied by adjusting the height and position of the VHF/UHF antenna. Outdoor antennas are recommended for best results. The most common types of television interference are shown below. If one of these symptoms appear when the unit is connected to a Cable TV system, the disturbance may be caused by the local Cable TV company broadcast.

IGNITION

Black spots or horizontal streaks may appear, the picture may flutter or drift. Usually caused by interference from automobile ignition systems, neon lamps or AC powered tools and appliances such as drills or hair dryers.



GHOSTS

Ghosts are caused by the television signal following two paths. One is the direct path and the other is reflected by tall buildings, hills or other large objects. Changing the direction or position of the antenna may improve the reception.



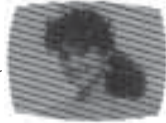
SNOW

If the unit is located far from the TV station, in a fringe reception area where the signal is weak, small dots may appear in the picture. If the signal is extremely weak, the installation of a larger external antenna may be necessary.



RADIO FREQUENCY INTERFERENCE (RFI)

Caused by two-way radios, this type of interference produces moving ripples or diagonal streaks in the picture. Some cases may cause a loss of contrast in the picture. Changing the direction and position of the antenna or installing an RFI filter may improve the picture.



PICTURE SIZE VARIATION

A slight picture size variation is normal when you adjust the CONTRAST or BRIGHTNESS settings.



CARE AND MAINTENANCE

To prevent fire or shock hazard, disconnect the unit from the power source before cleaning. The finish on the cabinet may be cleaned with mild soap and a soft, damp cloth and cared for as other furniture. Use caution when cleaning or wiping the plastic parts.

Troubleshooting

Check the following guide for the possible cause of a problem before contacting service.

SYMPTOMS	CAUSE	POSSIBLE SOLUTIONS	PAGE
POWER			
No power.	The AC power cord is not connected.	Connect the AC power cord to the AC outlet.	5
Although the power is on, the unit does not operate.	Cassette or disc is not inserted.	Insert a video cassette or disc.	40, 51
	The TIMER REC button is pressed.	Press the TIMER REC button to cancel timer recording.	47
TV BROADCAST RECEPTION			
Poor or no picture.	TV station experiencing problems.	Try another channel.	23
	Picture control is not adjusted.	Check picture control adjustments.	34
	Possible local interference.	Check for source of reception disturbance.	73
	Antenna (CABLE) connector is not connected or possible local interference.	Check CABLE connection or VHF/UHF antenna, reposition or rotate antenna.	13, 14
Poor or no color.	TV station experiencing problems.	Try another channel.	23
	Picture control is not adjusted.	Check picture control adjustments.	34
	Possible local interference.	Check for source of reception disturbance.	73
	Antenna (CABLE) connector is not connected or possible local interference.	Check CABLE connection or VHF/UHF antenna, reposition or rotate antenna.	13, 14
Picture wobbles or drifts.	TV station experiencing problems.	Try another channel.	23
	Antenna (CABLE) connector is not connected or possible local interference.	Check CABLE connection or VHF/UHF antenna, reposition or rotate antenna.	13, 14
	Cable TV channel is scrambled.	Try another channel.	23
No CATV reception.	CABLE connector is not connected.	Check all CABLE connections.	14
	TV/CABLE selection is set to the TV position.	Set the selection to the CABLE position.	27
	Cable TV service interrupted.	Contact your Cable TV company.	-
No reception above channel 13.	TV/CABLE selection is not set to the appropriate position.	Make sure selection is in the appropriate position.	27
	UHF antenna is not connected.	Check UHF antenna.	13
	TV station experiencing problems.	Try another channel.	23
Poor or no sound.	Antenna (CABLE) connector is not connected or possible local interference.	Check CABLE connection or VHF/UHF antenna, reposition or rotate antenna.	13, 14
	Possible local interference.	Check for source of reception disturbance.	73
	The MUTE button is pressed.	Press the MUTE button to cancel mute function.	24
	TV station stopped broadcasting.	Tune new channel.	23
TV shuts off.	Sleep timer is set.	Set Sleep Timer to "0".	24
	TV station experiencing problems or program tuned is not closed captions.	Try another channel.	23
Closed caption is not activated.	TV signal is weak.	Check CABLE connection of VHF/UHF antenna, reposition or rotate antenna.	13, 14
	The CLOSED CAPTION button is not pressed.	Press the CLOSED CAPTION button to turn on the closed caption.	25, 26

SYMPTOMS	CAUSE	POSSIBLE SOLUTIONS	PAGE
VCR			
TV recording does not work.	The video cassette's erase prevention tab is broken off.	Place a piece of adhesive tape over the hole.	40
Timer recording does not work.	The time is not set correctly.	Reset the present time.	20, 21
	The recording start/end time is not set correctly.	Reset the start/end time.	47
	The TIMER REC button is not pressed (the TIMER REC indicator is not lit).	Press the TIMER REC button (the TIMER REC indicator is lit).	47
Noise bars appear on the screen.	Tape is old or worn.	Replace the tape.	-
	Tracking adjustment is beyond range of automatic tracking circuit.	Adjust tracking manually using the TRK +/- buttons on the remote control.	42
	Video heads are dirty.	Clean the video heads.	44
DVD			
The playback picture has occasional distortion.	The disc is dirty.	Eject the disc and clean it.	8
	It is in fast forward or fast reverse playback.	Some times a small amount of picture distortion may appear. This is not a malfunction.	-
The unit does not start playback.	No disc is inserted.	Insert a disc.	51
	An unplayable disc is inserted.	Insert a playable disc (Check the disc type and color system).	9
	The disc is placed upside down.	Place the disc with the playback side down.	51
	The parental lock function is set.	Place the disc correctly inside the guide on the disc tray.	51
Playback does not follow the course of the disc's program.	It is in the mode of repeat playback.	Cancel the parental lock function or change the parental lock level.	70, 71
	It is in the mode of repeat playback, memory playback, etc.	These operations may prevent a proper progress of the contents.	-
"X" appears on the screen.	The function is prohibited with the unit or the disc.	-	9
REMOTE CONTROL			
Remote control does not operate.	The remote control is not aimed at the sensor.	Aim the remote control at the remote sensor.	12
	Distance is too far or too much light in the room.	Operate within 5 m or reduce the light of the room.	12
	There is an obstacle in the path of the beam.	Clear the path of the beam.	12
	The batteries are weak.	Replace the batteries.	12
	The batteries are not inserted correctly.	Insert correctly.	12

Specifications

Model	MW20H63	MW24H63	MW27H63
General			
Power supply	AC 120 V 60 Hz		
Power consumption			
Operation:	115 W	140 W	150 W
Stand by:	4 W	4 W	4 W
Picture tube	20 in. (508.0 mm)	24 in. (600.0 mm)	27 in. (676.0 mm)
Speaker	1-13/16 x 3-7/8 inches (45.7 x 99.1 mm), 8 x 2		
Audio output power	2.5 W + 2.5 W		
Weight	59.5 lbs (27 kg)	79.4 lbs (36 kg)	97.0 lbs (44 kg)
Dimensions			
Width:	22-9/16 inches (573 mm)	25-13/16 inches (655 mm)	29-1/8 inches (740 mm)
Height:	20-3/8 inches (517 mm)	22-13/16 inches (580 mm)	25-3/8 inches (645 mm)
Depth:	18-15/16 inches (481 mm)	18-5/8 inches (472.5 mm)	19-7/16 inches (493 mm)
Television system	NTSC standard, ATSC standard (8VSB), QAM		
Tuner	181 channel freq. synthesized		
	VHF 2-13		
	UHF 14-69		
	CATV 125 Channels		
Antenna input	UHF/VHF: 75 coaxial		
Color system	NTSC		
Video head	4 Rotary heads		
Audio track	Hi-Fi sound - 2 Tracks / MONO sound - 1 Track		
Hi-Fi frequency response	20 Hz to 20 kHz		
Hi-Fi dynamic range	More than 90 dB		
F.FWD/REW time at 25°C (77°F)	Approx. 1 minute and 48 seconds (with T-120 cassette tape)		
Applicable disc	DVD (12 cm, 8 cm), CD (12 cm, 8 cm)		
Frequency range	DVD: 4 Hz-22 kHz, CD: 4 Hz-20 kHz		
Operating conditions	Temperature: 5°C-40°C (41°F-104°F), Operating status: Horizontal, Humidity: Less than 80% RH (no condensation)		
Input/Output			
Video input	1.0 V (p-p), 75 , negative sync., pin jack x 2		
S-video input	Y input: 1 V (p-p), 75 , negative sync., Mini DIN 4 pin x 1 C input: 0.286V (p-p) (burst signal), 75		
Component video input	Y: 1 V (p-p), 75 , P _r : 0.7 V (p-p), 75 , P _b : 0.7 V (p-p), 75		
Audio input	~8dBm, 50 k , negative sinc., pin jack (L/R) x 2		
Audio output (DIGITAL COAXIAL)	0.5 V (p-p), 75 , pin jack x 1		
Headphone	3.5mm stereo mini jack x 1		
Supplied accessories			
Remote control (WC-SBH22)	1		
Batteries (R03/AAA)	2		

* Screen size is approximate.

- This model complies with the above specifications.
- Designs and specifications are subject to change without notice.
- This model may not be compatible with features and/or specifications that may be added in the future.

Limited United States Warranty

for model MW20H63/MW24H63/MW27H63 ("TV Combination")

Toshiba America Consumer Products, L.L.C. ("TACP") makes the following limited warranties to original consumers in the United States. THESE LIMITED WARRANTIES EXTEND TO THE ORIGINAL CONSUMER PURCHASER OR ANY PERSON RECEIVING THIS TV COMBINATION AS A GIFT FROM THE ORIGINAL CONSUMER PURCHASER AND TO NO OTHER PURCHASER OR TRANSFEREE.

TV COMBINATIONS PURCHASED IN THE U.S.A. AND USED ANYWHERE OUTSIDE OF THE U.S.A., INCLUDING, WITHOUT LIMITATION, CANADA AND MEXICO, ARE NOT COVERED BY THESE WARRANTIES.
TV COMBINATIONS PURCHASED ANYWHERE OUTSIDE OF THE U.S.A., INCLUDING, WITHOUT LIMITATION, CANADA AND MEXICO, AND USED IN THE U.S.A., ARE NOT COVERED BY THESE WARRANTIES.

Limited Ninety (90) Day Warranty on Labor

TACP warrants this TV Combination and its parts against defects in materials or workmanship for a period of ninety (90) days after the date of original retail purchase. **DURING THIS PERIOD, TACP WILL, AT TACP'S OPTION, REPAIR OR REPLACE A DEFECTIVE PART WITH A NEW OR REFURBISHED PART WITHOUT CHARGE TO YOU FOR PARTS OR LABOR.** During this period, TACP Authorized Service Station personnel will come to your home when warranty service is required. Depending on the type of repair required, the service will either be performed in your home or the TV Combination will be taken to a TACP Authorized Service Station for repair and returned to your home at no cost to you.

Limited One (1) Year Warranty on Parts

TACP further warrants the parts in this TV Combination against defects in materials or workmanship for a period of one (1) year after the date of original retail purchase. **DURING THIS PERIOD, TACP WILL, AT TACP'S OPTION, REPAIR OR REPLACE A DEFECTIVE PART WITH A NEW OR REFURBISHED PART WITHOUT CHARGE TO YOU FOR THE PART, PROVIDED THAT IF A DEFECTIVE PART IS REPAIRED OR REPLACED AFTER NINETY (90) DAYS AFTER THE DATE OF ORIGINAL RETAIL PURCHASE, YOU MUST PAY ALL LABOR CHARGES IN CONNECTION WITH THE REPAIR OR REPLACEMENT THEREOF.** After the date that is ninety (90) days after the date of original retail purchase, you may request in-home service at your expense, or you may deliver the entire TV Combination to a TACP Authorized Service Station. If you elect to deliver the entire TV Combination to a TACP Authorized Service Station, you must pay for all transportation and insurance charges for the TV Combination to and from the TACP Authorized Service Station.

Limited Two (2) Year Warranty on Picture Tube

TACP further warrants the picture tube in this TV Combination against defects in materials or workmanship for a period of two (2) years after the date of original retail purchase. **DURING THIS PERIOD, TACP WILL, AT TACP'S OPTION, REPAIR OR REPLACE A DEFECTIVE PICTURE TUBE WITH A NEW OR REFURBISHED PICTURE TUBE WITHOUT CHARGE TO YOU, PROVIDED THAT IF A DEFECTIVE PICTURE TUBE IS REPAIRED OR REPLACED AFTER NINETY (90) DAYS AFTER THE DATE OF ORIGINAL RETAIL PURCHASE, YOU MUST PAY FOR ALL LABOR CHARGES IN CONNECTION WITH THE REPAIR OR REPLACEMENT THEREOF.** After the date that is ninety (90) days after the date of original retail purchase, you may request in-home service at your expense, or you may deliver the entire TV Combination to a TACP Authorized Service Station. If you elect to deliver the entire TV Combination to a TACP Authorized Service Station, you must pay for all transportation and insurance charges for the TV Combination to and from the TACP Authorized Service Station.

Rental Units

The warranty for TV Combination rental units begins on the date of the first rental or thirty (30) days after the date of shipment to the rental firm, whichever comes first.

Limited Warranty for Commercial Units

TACP warrants TV Combinations that are sold and used for commercial purposes as follows: all parts are warranted against defects in materials or workmanship for a period of ninety (90) after the date of original retail purchase. **DURING THIS PERIOD, TACP WILL, AT TACP'S OPTION, REPAIR OR REPLACE A DEFECTIVE PART WITH A NEW OR REFURBISHED PART WITHOUT CHARGE TO YOU.**

Owner's Manual and Product Registration Card

Read this owner's manual thoroughly before operating this TV Combination. Complete and mail the enclosed product registration card or register your TV Combination online at www.iaco.toshiba.com as soon as possible. By registering your TV Combination you will enable TACP to bring you new products specifically designed to meet your needs and help us to contact you in the unlikely event a safety notification is required under the U.S. Consumer Product Safety Act. Failure to complete and return the product registration card does not diminish your warranty rights.

(continued on next page)

Limited United States Warranty (Continued)

Your Responsibility

THE ABOVE WARRANTIES ARE SUBJECT TO THE FOLLOWING CONDITIONS:

- (1) You must retain your original bill of sale or provide other proof of purchase.
- (2) All warranty servicing of this TV Combination must be performed by an Authorized TACP Service Station.
- (3) The warranties from TACP are effective only if this TV Combination is purchased and operated in the Continental U.S.A. or Puerto Rico.
- (4) Labor service charges for set installation, setup, adjustment of customer controls, and installation or repair of antenna systems are not covered by this warranty. Reception problems caused by inadequate antenna systems, misaligned satellite dishes, cable television distribution, VCRs, DVD players/recorders, personal computer level IEEE-1394 devices, and any other connected signal source device are your responsibility.
- (5) Warranties extend only to defects in materials or workmanship as limited above, and do not extend to any TV Combination or parts that have been lost or discarded by you or to damage to the TV Combination or parts caused by fires, misuse, accident, Acts of God (such as lightning or fluctuations in electric power), improper installation, improper maintenance, or use in violation of instructions furnished by TACP; use or malfunction through simultaneous use of this TV Combination and connected equipment; or to units that have been modified or had the serial number removed, altered, defaced, or rendered illegible.

How to Obtain Warranty Service

If, after following all of the operating instructions in this manual and reviewing the section entitled "Troubleshooting," you find that service is needed:

- (1) To find the nearest TACP Authorized Service Station, visit TACP's website at www.tacp.toshiba.com/service or contact TACP's Consumer Solution Center toll free at 1-800-631-3811.
- (2) You must present your original bill of sale or other proof of purchase to the TACP Authorized Service Station.

For additional information, visit TACP's website:
www.tacp.toshiba.com

ALL WARRANTIES IMPLIED BY THE LAW OF ANY STATE OF THE U.S.A., INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY LIMITED TO THE DURATION OF THE LIMITED WARRANTIES SET FORTH ABOVE. WITH THE EXCEPTION OF ANY WARRANTIES IMPLIED BY THE LAW OF ANY STATE OF THE U.S.A. AS HEREBY LIMITED, THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, GUARANTEES, AGREEMENTS, AND SIMILAR OBLIGATIONS OF TACP WITH RESPECT TO THE REPAIR OR REPLACEMENT OF ANY PARTS. IN NO EVENT SHALL TACP BE LIABLE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, LOST PROFITS, BUSINESS INTERRUPTION, OR MODIFICATION OR ERASURE OF RECORDED DATA CAUSED BY USE, MISUSE OR INABILITY TO USE THIS TV COMBINATION).

No person, agent, distributor, dealer, or company is authorized to change, modify, or extend the terms of these warranties in any manner whatsoever. The time within which an action must be commenced to enforce any obligation of TACP arising under the warranty or under any statute or law of the United States or any state thereof is hereby limited to ninety (90) days from the date you discover, or should have discovered, the defect. This limitation does not apply to implied warranties arising under the law of any state of the U.S.A.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE IN THE U.S.A. SOME STATES OF THE U.S.A. DO NOT ALLOW LIMITATIONS ON THE DURATION OF AN IMPLIED WARRANTY, WHEN AN ACTION MAY BE BROUGHT, OR THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES. THEREFORE, THE ABOVE PROVISIONS MAY NOT APPLY TO YOU UNDER SUCH CIRCUMSTANCES.

Memo

CAUTION

THIS DIGITAL VIDEO PLAYER EMPLOYS A LASER SYSTEM.

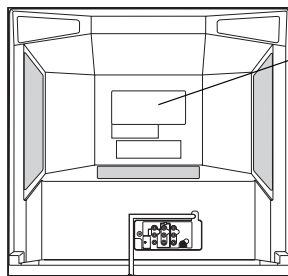
TO ENSURE PROPER USE OF THIS PRODUCT, PLEASE READ THIS SERVICE MANUAL CAREFULLY AND RETAIN FOR FUTURE REFERENCE. SHOULD THE UNIT REQUIRE MAINTENANCE, CONTACT AN AUTHORIZED SERVICE LOCATION-SEE SERVICE PROCEDURE.

USE OF CONTROLS, ADJUSTMENTS OR THE PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

TO PREVENT DIRECT EXPOSURE TO LASER BEAM, DO NOT TRY TO OPEN THE ENCLOSURE. VISIBLE LASER RADIATION MAY BE PRESENT WHEN THE ENCLOSURE IS OPENED. DO NOT STARE INTO BEAM.

Location of the required Marking

The rating sheet and the safety caution are on the rear of the unit.



CERTIFICATION: COMPLIES WITH FDA
RADIATION PERFORMANCE STANDARDS,
21 CFR SUBCHAPTER J.

PREPARATION OF SERVICING

The laser diode used for a pickup head may be destroyed with external static electricity.

Moreover, even if it is operating normally after repair, when static electricity discharge is received at the time of repair, the life of the product may be shortened.

Please perform the following measure against static electricity, be careful of destruction of a laser diode at the time of repair.

- Place the unit on a workstation equipped to protect against static electricity, such as conductive mat.
- Soldering iron with ground wire or ceramic type is used.
- A worker needs to use a ground conductive wrist strap for body.

SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES


As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.

Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a  mark, the designated parts must be used.

4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.

Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.

Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

(INSULATION CHECK PROCEDURE)

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the eternal exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note 1]**.
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

[Note 1]

If you have not the 500V insulation resistance meter, use a Tester.

[Note 2]

External exposure metal: Antenna terminal

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the VERSION LETTER.)

1. MODEL NUMBER and VERSION LETTER

The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.

2. PART NO. and DESCRIPTION

You can find it in your SERVICE MANUAL.

IMPORTANT SAFEGUARDS

1. READ INSTRUCTIONS

All the safety and operating instructions should be read before the unit is operated.

2. RETAIN INSTRUCTIONS

The safety and operating instructions should be retained for future reference.

3. HEED WARNINGS

All warnings on the unit and in the operating instructions should be adhered to.

4. FOLLOW INSTRUCTIONS

All operating and use instructions should be followed.

5. CLEANING

Unplug this unit from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

6. ATTACHMENTS

Do not use attachments not recommended by the unit's manufacturer as they may cause hazards.

7. WATER AND MOISTURE

Do not use this unit near water. For example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.

8. ACCESSORIES

Do not place this unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall, causing serious injury, and serious damage to the unit. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer.

- 8A. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

9. VENTILATION

Slots and openings in the cabinet and in the back or bottom are provided for ventilation, to ensure reliable operation of the unit, and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the unit on a bed, sofa, rug, or other similar surface. This unit should never be placed near or over a radiator or heat source. This unit should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

10. POWER SOURCES

This unit should be operated only from the type of power source indicated on the rating plate. If you are not sure of the type of power supply to your home, consult your appliance dealer or local power company. For units intended to operate from battery power, or other sources, refer to the operating instructions.

11. GROUNDING OR POLARIZATION

This unit is equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug. If your unit is equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin, this plug will only fit into a grounding-type power outlet. This too, is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.

12. POWER-CORD PROTECTION

Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

13. LIGHTNING

To protect your unit from a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the unit due to lightning and power line surges.

14. POWER LINES

An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits, as contact with them might be fatal.

15. OVERLOADING

Do not overload wall outlets and extension cords, as this can result in a risk of fire or electric shock.

16. OBJECT AND LIQUID ENTRY

Do not push objects through any openings in this unit, as they may touch dangerous voltage points or short out parts that could result in fire or electric shock. Never spill or spray any type of liquid into the unit.

PORTABLE CART WARNING
(symbol provided by RETAC)



S3126A

IMPORTANT SAFEGUARDS

(CONTINUED)

17. OUTDOOR ANTENNA GROUNDING

If an outside antenna or cable system is connected to the unit, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI/NFPA 70, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

18. SERVICING

Do not attempt to service this unit yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

19. DAMAGE REQUIRING SERVICE

Unplug this unit from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- a. When the power-supply cord or plug is damaged.
- b. If liquid has been spilled, or objects have fallen into the unit.
- c. If the unit has been exposed to rain or water.
- d. If the unit does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions, as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the unit to its normal operation.
- e. If the unit has been dropped or the cabinet has been damaged.
- f. When the unit exhibits a distinct change in performance, this indicates a need for service.

20. REPLACEMENT PARTS

When replacement parts are required, be sure the service technician uses replacement parts specified by the manufacturer or those that have the same characteristics as the original parts.

Unauthorized substitutions may result in fire, electric shock or other hazards.

21. SAFETY CHECK

Upon completion of any service or repairs to this unit, ask the service technician to perform safety checks to determine that the unit is in proper operating condition.

22. WALL OR CEILING MOUNTING

The product should be mounted to a wall or ceiling only as recommended by the manufacturer.

23. HEAT

The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

24. DISC TRAY

Keep your fingers well clear of the disc tray as it is closing. It may cause serious personal injury.

25. CONNECTING

When you connect the product to other equipment, turn off the power and unplug all of the equipment from the wall outlet. Failure to do so may cause an electric shock and serious personal injury. Read the owner's manual of the other equipment carefully and follow the instructions when making any connections.

26. SOUND VOLUME

Reduce the volume to the minimum level before you turn on the product. Otherwise, sudden high volume sound may cause hearing or speaker damage.

27. SOUND DISTORTION

Do not allow the product output distorted sound for a longtime. It may cause speaker overheating and fire.

28. HEADPHONES

When you use the headphones, keep the volume at a moderate level. If you use the headphones continuously with high volume sound, it may cause hearing damage.

29. LASER BEAM

Do not look into the opening of the disc tray or ventilation opening of the product to see the source of the laser beam. It may cause sight damage.

30. DISC

Do not use a cracked, deformed, or repaired disc. These discs are easily broken and may cause serious personal injury and product malfunction.

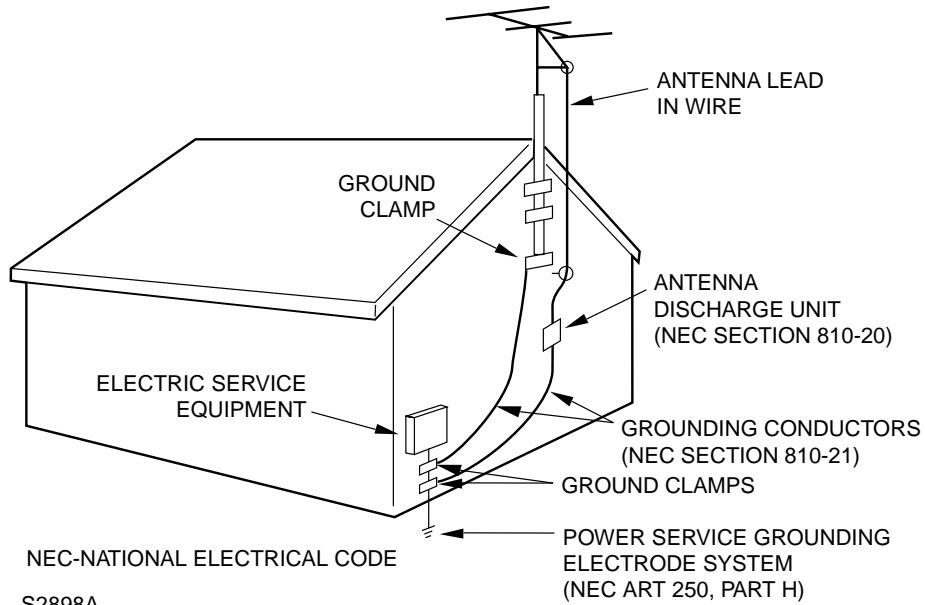
31. NOTE TO CATV SYSTEM INSTALLER

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

IMPORTANT SAFEGUARDS

(CONTINUED)

EXAMPLE OF ANTENNA GROUNDING AS PER THE NATIONAL ELECTRICAL CODE



WHEN REPLACING DVD DECK

[Removing the DVD Deck]

Before removing Pick Up PCB and DVD MT PCB connector, short circuit the position shown in **Fig. 1** using a soldering iron. If you remove the DVD Deck with no soldering, the Laser may be damaged.

[Installing the DVD Deck]

Remove all the soldering on the short circuit position after the connection of Pick Up PCB and DVD PCB connector.

NOTE

- Before your operation, please read "PREPARATION OF SERVICING".
- Use the Lead Free solder.
- Manual soldering conditions
 - Soldering temperature: $320 \pm 20^{\circ}\text{C}$
 - Soldering time: Within 3 seconds
 - Soldering combination: Sn-3.0Ag-0.5Cu
- When Soldering/Removing of solder, use the drawing equipment over the Pick Up Unit to keep the Flux smoke away from it.

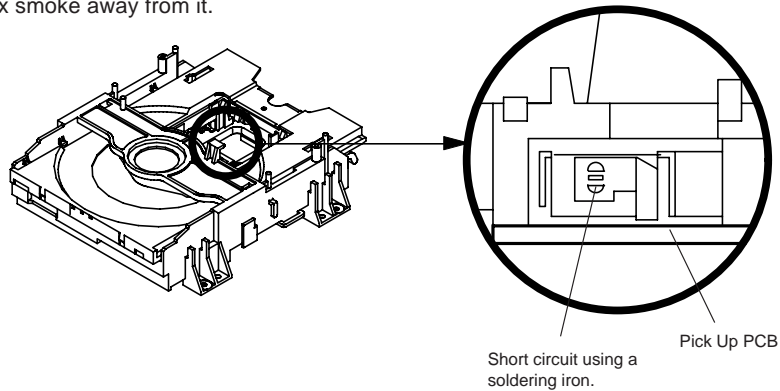


Fig. 1

TAPE REMOVAL METHOD AT NO POWER SUPPLY

1. Remove the TV/DVD/VCR block from the main unit as shown in **Fig. 1** below.
(Refer to item 1 of the **DISASSEMBLY INSTRUCTIONS**.)
2. Remove one screw of the Loading Motor from the insert hole for screw driver and remove the Loading Motor.
3. Rotate the Pinch Roller Cam in the direction of the arrow by hand to slacken the Video Tape.
(Refer to **Fig. 2**)
4. Rotate the Clutch Ass'y either directions to wind the Video Tape in the Cassette Case.
5. Repeat steps 3~4. Then take out the Video Cassette from the Deck Chassis. Be careful not to scratch the tape.

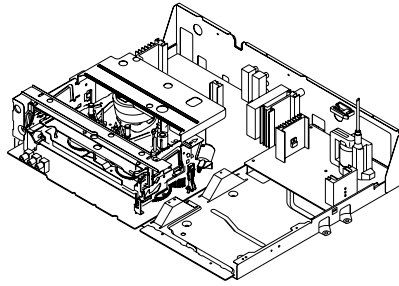


Fig. 1

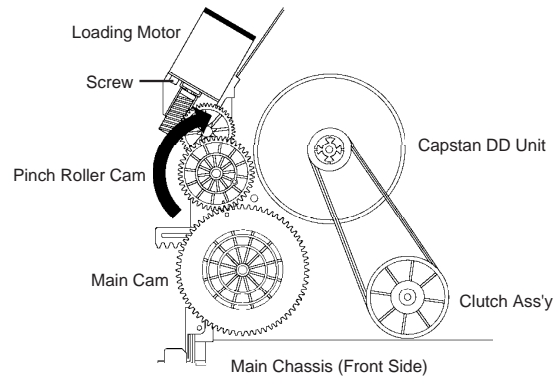


Fig. 2

DISC REMOVAL METHOD AT NO POWER SUPPLY

1. Remove the Back Cabinet and AV PCB/DVD Block. (Refer to item 1 of the **DISASSEMBLY INSTRUCTIONS**.)
2. Rotate the Main Gear in the direction of the arrow by hand.
(Refer to **Fig. 1**)
3. Manually open the Tray.

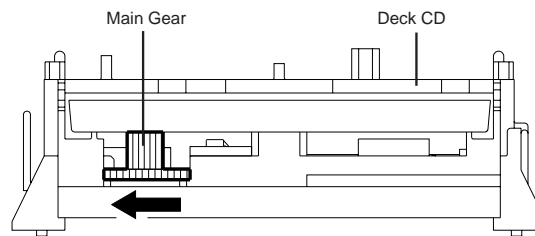


Fig. 1


PARENTAL CONTROL - RATING LEVEL 4 DIGIT PASSWORD CANCELLATION

If the stored 4 digit password in the Rating Level menu needs to be cancelled, please follow the steps below.

1. Turn Unit ON.
2. Set the DVD to the Stop Mode.
3. Check that 'No disc' is displayed on the screen.
4. Press and hold the 'STOP' button on the front panel.
5. Simultaneously press and hold the '7' key on the remote control unit.
6. Hold both keys for more than 3 seconds.
7. The On Screen Display message 'PASSWORD CLEAR' will appear.
8. The 4 digit password has now been cleared.

TRAY LOCK

Tray cannot be opened by setting the Tray Lock, please follow the steps below.

1. Turn Unit ON.
2. Set the DVD to the Stop Mode.
3. Press it in order of 'SETUP', 'SUBTITLE', '3', 'AUDIO SELECT' and '0' key of a remote control unit.
4. The On Screen Display message '  ' will appear.
5. The Tray Lock has now been set up.

To unlock the Tray Lock, please follow the steps below.


1. Turn Unit ON.
2. Set the DVD to the Stop Mode.
3. Press it in order of 'SETUP', 'SUBTITLE', '3', 'AUDIO SELECT' and '0' key of a remote control unit.
4. The On Screen Display message '  ' will appear.
5. The Tray Lock has now been cleared.

TABLE OF CONTENTS

- GREEN PRODUCT PROCUREMENT
- LEAD-FREE SOLDER
- OWNER'S MANUAL

CAUTION	A1-1
SERVICE NOTICES ON CHECKING	A1-2
HOW TO ORDER PARTS	A1-2
IMPORTANT SAFEGUARDS	A1-3-A1-5
WHEN REPLACING DVD DECK	A1-6
TAPE REMOVAL METHOD AT NO POWER SUPPLY	A1-7
DISC REMOVAL METHOD AT NO POWER SUPPLY	A1-7
PARENTAL CONTROL - RATING LEVEL	A1-8
TRAY LOCK	A1-8
TABLE OF CONTENTS	A2-1
GENERAL SPECIFICATIONS	A3-1-A3-6
DISASSEMBLY INSTRUCTIONS	
1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS	B1-1-B1-3
2. REMOVAL OF VCR DECK PARTS	B2-1-B2-6
3. REMOVAL OF DVD DECK PARTS	B3-1-B3-4
4. REMOVAL OF ANODE CAP	B4-1
5. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC	B5-1, B5-2
KEY TO ABBREVIATIONS	C1-1, C1-2
SERVICE MODE LIST	C2-1
PREVENTIVE CHECKS AND SERVICE INTERVALS	C3-1, C3-2
RE-WRITE FOR DVD FIRMWARE	C4-1
RE-WRITE FOR DIGITAL SOFT FIRMWARE	C4-2
WHEN REPLACING OF EEPROM (MEMORY) IC	C5-1
SERVICING FIXTURES AND TOOLS	D1-1
PREPARATION FOR SERVICING	D1-2
MECHANICAL ADJUSTMENTS	D2-1-D2-4
ELECTRICAL ADJUSTMENTS	D3-1-D3-7
TROUBLESHOOTING GUIDE	E-1-E-22
BLOCK DIAGRAMS	
DVD	F-1, F-2
DIGITAL MODULE	F-3, F-4
Y/C/AUDIO/HEAD AMP	F-5, F-6
MICON	F-7, F-8
IN/OUT	F-9, F-10
CHROMA/IF	F-11, F-12
SOUND AMP/SURROUND	F-13, F-14
HI-FI/DEMODULATOR	F-15, F-16
TUNER/DVD IN/OUT/COMB FILTER	F-17, F-18
REGULATOR	F-19, F-20
TV	F-21, F-22
PRINTED CIRCUIT BOARDS	
DVD MT	G-1, G-2
VCR MT	G-3-G-6
DIGITAL	G-7, G-8
DEFLECTION/CRT/OPERATION	G-9, G-10
DEFLECTION/CRT	G-11, G-12
LOADING MOTOR/SW	G-13, G-14
SCHEMATIC DIAGRAMS	
MPEG/MICON/DSP	H-1, H-2
MEMORY	H-3, H-4
MOTOR DRIVE	H-5, H-6
AUDIO/VIDEO	H-7, H-8
Y/C/AUDIO/HEAD AMP	H-9, H-10
MICON	H-11, H-12
IN/OUT	H-13, H-14
CHROMA/IF	H-15, H-16
HI-FI	H-17, H-18
TUNER/DVD IN/OUT	H-19, H-20
REGULATOR	H-21, H-22
TV POWER	H-23, H-24
COMB FILTER	H-25, H-26
DEFLECTION	H-27, H-28
SOUND AMP/SURROUND	H-29, H-30
CRT	H-31, H-32
OPERATION	H-33, H-34
POWER & GROUND	H-35, H-36
SDRAM	H-37, H-38
FLASH/GPIO	H-39, H-40
VIF/SIF	H-41, H-42
AV IN/OUT	H-43, H-44
LOADING MOTOR/SW	H-45, H-46
INTERCONNECTION DIAGRAM	H-47, H-48
WAVEFORMS	I-1-I-4
MECHANICAL EXPLODED VIEW	J1-1-J1-3
CHASSIS EXPLODED VIEW	J2-1, J2-2
DVD DECK EXPLODED VIEW	J3-1
MECHANICAL REPLACEMENT PARTS LIST	K1-1, K1-2
CHASSIS REPLACEMENT PARTS LIST	K2-1
DVD DECK REPLACEMENT PARTS LIST	K3-1
ELECTRICAL REPLACEMENT PARTS LIST	K4-1-K4-7

GENERAL SPECIFICATIONS

G-1	TV System	CRT	CRT Size / Visual Size	24 inch / 600.0mmV
			CRT Type	Flat
			Magnetic Field BV/BH	+0.45G / 0.18G
		Color System		NTSC
		Speaker		2 Speaker
			Position	Front Side
			Size	1.8 x 3.9 Inch
			Impedance	8 ohm
		Sound Output	MAX 10%(Typical)	2.5W + 2.5W
G-2	VCR System	System		VHS Player / Recorder
		Video System		NTSC
		Hi-Fi STEREO		Yes
		NTSC PB		-
		Deck		OVD-7
		Heads	Video Head	4 Heads
			FM Audio Head	2 Heads
			Audio /Control	Mono /Yes
			Erase(Full Track Erase)	Yes
			Erase (Normal Audio Track Erase)	Yes
		Tape	Rec	PAL
		Speed		NTSC
			Play	PAL
				NTSC
		Fast Forward / Rewind Time (Approx.) at 25°C		FF:1'48"/REW:1'48"
			with Cassette	T-120
G-3	DVD System	Color System		NTSC
		Disc		DVD, CD-DA, CD-R/RW, Video CD DVD-R/RW (Video Format Only)
		Disc Diameter		120 mm , 80 mm
		Drive		DM3PB
		Search speed	Fwd	4 step
			Actual	2-120 times(DVD, VIDEO CD) 4-40 times (CD)
			Rev	4 step
			Actual	2-120 times(DVD, VIDEO CD) 4-40 times (CD)
		Slow speed	Fwd	1/7 - 1/2 times
			Actual	--
			Rev	--
			Actual	--
G-4	Tuning System	Broadcasting System	Analog	US System M
			Digital	ATSC(8VSB), QAM
		Tuner and Receive CH	System	1 Tuner
			Destination	US(w/CABLE)
			CH Coverage	2~69, 4A, A-5~A-1, A-I, J~W, W+1~W+84
		Intermediate Frequency	Digital	44.00MHz
			Analog	Picture(FP) 45.75MHz Sound(FS) 41.25MHz FP-FS 4.5MHz
		Preset CH		No
		Stereo/Dual TV Sound		US-Stereo
		Tuner Sound Muting		Yes

GENERAL SPECIFICATIONS

G-5	Signal	Video Signal	Input Level	1 V p-p/75 ohm
			Output Level	-
			S/N Ratio (Weighted) at DVD Mode	-
			S/N Ratio (Weighted) at VCR Mode	-
			Horizontal Resolution at DVD Mode	-
			Horizontal Resolution at VCR(SP)Mode	-
		RGB Signal	Output Level	-
		Audio Signal VCR DVD	Input Level	-8.0dBm/50k ohm
			Output Level(0dB=0.775Vrms)	-
			Output Level(-20dBFs 0dBFs=2.0Vrms)	-
			Digital Output Level	0.5 V p-p/75 ohm(DVD/DTV)
			S/N Ratio at DVD (Weighted)	-
			S/N Ratio at VCR (SP)(CCIR Filter:ON)	-
			Harmonic Distortion at DVD Mode	-
			Harmonic Distortion at VCR(SP) Mode	-
			Frequency Response :	
			DVD Mode at DVD	-
			at Video CD	-
			at SVCD	-
			at CD	-
			VCR Mode at SP	-
			at LP	-
			at SLP	-
		Hi-Fi Audio Signal	Dynamic Range : More than	90 dB
			Frequency Response :	20Hz - 20kHz
			Wow And Flutter : Less than	0.01 %Wrms
			Channel Separation : More than	60 dB
			Harmonic Distortion : Less than	1.0 %
G-6	Power	Power Source	AC	120V,60Hz
			DC	-
		Power Consumption	at AC	140 W at 120 V 60 Hz
			at DC	-
			Stand by (at AC) Per Year	4 W at 120 V 60 Hz -
		Protector	Energy Star	No
			Power Fuse	Yes
			Safety Circuit	Yes
G-7	Regulation		IC Protector(Micro Fuse)	No
			Dew Sensor	No
			Safety	UL(UL1492)
			Radiation	FCC
			X-Radiation	DHHS
G-8	Temperature		Laser	DHHS
			Operation	+5°C ~ +40°C
			Storage	-20°C ~ +60°C
G-9	Operating Humidity			Less than 80% RH
G-10	OSD Language			English French Spanish
G-11	Clock,Timer and Timer Back-up	Calendar		1990/1/1 ~ 2081/12/31
		Timer Events		8 Program/ 1 Month
		One Touch Recording	Max Time	6 Hours
		Clock Display		12H
		Sleep Timer	Max Time	120 Min
			Step	10 Min
		On/Off Timer	Program(On Timer / Off Timer)	1 Program
		Auto Shut Off	No Signal	15 Min
			No Operation	- Min
		Timer Back-up (at Power Off Mode)		5 Sec

GENERAL SPECIFICATIONS

G-12	Remote Control Unit	Unit	RC-KH
		Glow in Dark Remocon	No
		Remocon Format	TOSHIBA
		Format	TOSHIBA
		Custom Code	40-BFh, 44-BBh, 45-BAh
		Power Source	3V
		Voltage(D.C)	UM-4 x 2 pcs
		UM size x pcs	
		Total Keys	50
		Keys	
		TV/VCR	Yes
		DVD	Yes
		Power	Yes
		1	Yes
		2	Yes
		3	Yes
		4	Yes
		5	Yes
		6	Yes
		7	Yes
		8	Yes
		9	Yes
		0	Yes
		Channel-	Yes
		Channel+	Yes
		Volume-	Yes
		Volume+	Yes
		Display/-	Yes
		Sleep	Yes
		Audio Select	Yes
		Mute	Yes
		Channel Return / Skip-	Yes
		Closed Caption / Skip+	Yes
		TIMER REC	Yes
		REC/OTR	Yes
		Slow+	Yes
		Play	Yes
		Stop	Yes
		REV(Rew)	Yes
		FF(F. Fwd)	Yes
		Pause / Still / Step	Yes
		CM Skip / Jump	Yes
		Speed / Return	Yes
		Counter Reset / Angle	Yes
		Zero Return / Subtitle	Yes
		Input Select / Zoom	Yes
		Menu / Setup	Yes
		Program / Repeat A-B / DVD/USB	No
		Program / Repeat A-B	Yes
		D.Tracking / Top Menu	Yes
		Tracking+ / DVD Menu	Yes
		Tracking- / Play Mode	Yes
		Cancel	Yes
		Cursor Up	Yes
		Cursor Down	Yes
		Cursor Left	Yes
		Cursor Right	Yes
		Enter	Yes
		Open/Close	Yes
		Eject	Yes
		Picture Size	Yes

GENERAL SPECIFICATIONS

G-13	Features (TV/VCR)	Auto Head Cleaning	Yes
		VIDEO PLUS+(SHOWVIEW,G-CODE)	No
		Forward / Reverse Picture Search	Yes
		Index Search	No
		SQPB	No
		CM Skip(30sec x 6 Times)	Yes
		Zero Return	Yes
		End Call	No
		TV Monitor	No
		Program Extend	No
		Picture	
		Brightness , Contrast , Color, Sharpness	Yes
		Tint	Yes
		Mode (Picture Preference)	No
		Color Temperature	No
		CableClear	No
		Cinema Mode	No
		Aspect	No
		Audio	
		Tone Control (Bass/Treble/Balance)	Yes
		Stable Sound	Yes
		Surround	Yes
		Timer	
		On Timer	Yes
		Off Timer	Yes
		Sleep Timer	Yes
		Game Timer	No
		Tuning	
		Auto CH Memory	Yes
		ADD/Delete	Yes
		Label	
		CH Label	No
		Video Label	No
		Favorite CH	No
		Lock	
		Hotel Lock	No
		Channel Lock	No
		Video Lock	No
		Front Panel Lock	No
		Closed Caption	Yes
		CC Advance	Yes
		Signal Mater	Yes
		Audio Language	Yes
		Auto Setup	Yes
		Auto Clock	Yes
		Picture Size	Yes
		Picture Scroll	No
		Zoom	Yes
		CABLE	Yes
		QAM	Yes
		SAP	Yes
		Comb Filter	Yes
			3 D
		VM Circuit	No
		Protect of FBT Leak Circuit	Yes
		TV Auto Shut off Function	Yes
		Power On Memory	No
		Choke Coil	No
		V-chip	
		USA V-chip	Yes
		CANADA V-chip	No
		RRT Setup	Yes
		Digital Out	
		Dolby Digital	Yes
		MPEG	No
		PCM	No
		DTS	No
		HDMI Input	No
		Component Input	Yes
		720x480i (4:3)	Yes (60Hz)
		720x480i (16:9)	Yes (60Hz)
		720x480p (4:3)	No
		720x480p (16:9)	No
		720x576i (4:3)	No
		720x576i (16:9)	No
		720x576p (4:3)	No
		720x576p (16:9)	No
		1280x720p	No
		1920x1080i	No

GENERAL SPECIFICATIONS

	Features (DVD)	Tray Lock	Yes
		Auto Stop (Pause, and Resume Stop after 5min.)	Yes
		USB (Some USB devices may not be usable.)	No
		Card Slot Reading (Not secured Data)	No
		Video CD Playback	Yes
		SVCD Playback	No
		MP3 Playback	Yes
		WMA Playback	Yes
		JPEG Playback	Yes
		DivX Play back	Yes
		DMF Support	No
		Digital Out (Dolby Digital)	Yes
		(MPEG)	Yes
		(PCM)	Yes
		(DTS)	Yes
		Down Mix Out (Dolby Digital)	Yes
		(DTS)	No
		Surround	No
		Closed Caption Signal in VBI (DVD Playback)	Yes
		Screen Saver	No
		Audio DAC	192kHz / 24bit
		Copy (Disc to Tape)	Yes (by Conditioning)
G-14	Accessories	Owner's Manual Language	English
		w/Guarantee Card	Yes
		Remote Control Unit	Yes
		Battery	Yes
		UM size x pcs	UM-4 x 2 pcs
		OEM Brand	No
		Rod Antenna	No
		Poles	-
		Terminal	-
		Loop Antenna	No
		Terminal	-
		U/V Mixer	No
		300 ohm to 75 ohm Antenna Adapter	No
		Antenna Change Plug	No
		DC Car Cord (Center+)	No
		AC Plug Adapter	No
		AC Cord	No
		AV Cord (2Pin-1Pin)	No
		Guarantee Card	No
		Registration Card	Yes
		ESP Card	No
		Warning Sheet	Yes
		Dew/AHC Caution Sheet	No
		Quick Set-up Sheet	Yes
		Circuit Diagram	No
		Service Facility List	No
		Important Safeguard	No
		Information Sheet (Return)	Yes
		Information Sheet (RRT)	No
		Netflix Card	No

GENERAL SPECIFICATIONS

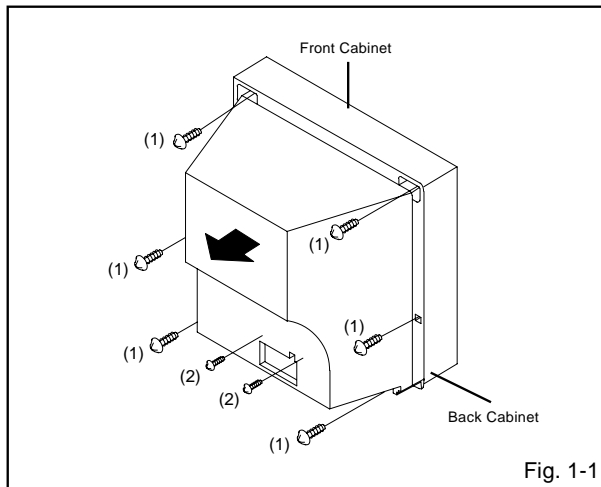
G-15	Interface	Switch	Front	Power (Tact)	Yes
				Channel Up	Yes
				Channel Down	Yes
				Volume Up	Yes
				Volume Down	Yes
				Play (VCR)	Yes
				Stop / Eject (VCR)	Yes
				F.FWD/Cue (VCR)	Yes
				Rew/Rev (VCR)	Yes
				REC/OTR (VCR)	Yes
				Play (DVD)	Yes
				Stop (DVD)	Yes
				Skip+ /Search+ (DVD)	Yes
				Skip- /Search- (DVD)	Yes
				Open/Close (DVD)	Yes
				Input Select	No
				Main Power SW	No
		Indicator	Power	Yes (Red)	
			REC/OTR	Yes (Red)	
			T-REC	Yes (Red)	
			TV/VCR	No	
		Terminals	Front	DVD	No
				Video Input	RCA x 1
				Audio Input	RCA x 2 (L/MONO,R)
				S-Video Input	No
				USB	No
			Rear	Other Terminal	HeadPhone (Stereo & Mono, 3.5mm)
				Video Input	RCA x 1
				Audio Input	RCA x 2 (L/MONO,R)
				S-Video Input	Yes
				Video Output	No
				Audio Output	No
				Component Input	RCA x 3
				Audio Input	RCA x 2 (L/MONO, R)
				Digital Audio Output	Coaxial (DTV & DVD Only)
				VHF/UHF Antenna Input	F Type
				AC Inlet	No
G-16	Set Size	Approx. W x D x H (mm)	655 x 472.5 x 580		
G-17	Weight	Net (Approx.)	36.0kg (79.4lbs)		
		Gross (Approx.)	40.0kg (88.2lbs)		
G-18	Carton	Master Carton		No	
			Content	-	
			Material	-	
			Dimensions W x D x H(mm)	-	
		Gift Box	Description of Origin	-	
			Material	Double/White	
			Dimensions W x D x H(mm)	766 x 579.5 x 711	
			Description of Origin	Yes	
		Drop Test	Natural Dropping At	1 Corner / 2 Edges / 4 Surfaces	
			Height (cm)	60	
		Container Stuffing(40' container)		180	Sets
		w/Pallet			No
		w/Wrapping			No
G-19	Material	Cabinet	Front	PS	94V0 DECABROM
			Rear	PS	94V0 DECABROM
		PCB	Jack Panel	-	
			Non-Halogen Demand		No
			Eyelet Demand	Yes	
G-20	Environment	Environmental standard requirement (by buyer)		Green procurement of TOSHIBA	
		Pb-free		Phase3(Phase3A)	
			Measures for Whisker	Yes	

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

1-1: BACK CABINET (Refer to Fig. 1-1)

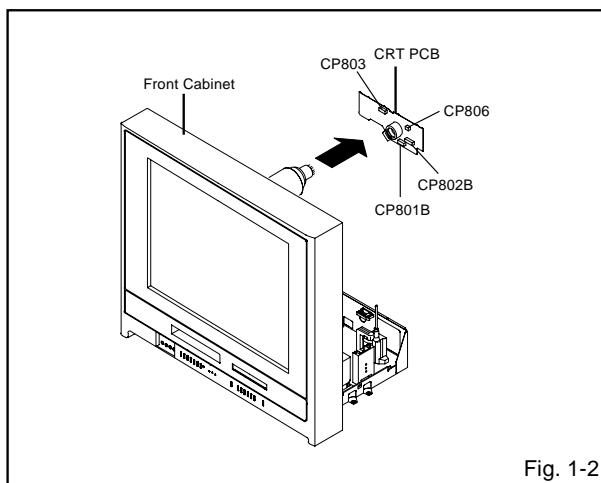
1. Remove the 6 screws (1).
2. Remove the 2 screws (2).
3. Remove the Back Cabinet in the direction of arrow.



1-2: CRT PCB (Refer to Fig. 1-2)

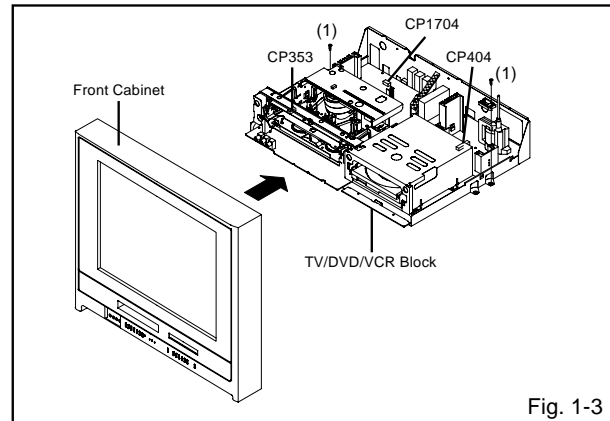
CAUTION: BEFORE REMOVING THE ANODE CAP, DISCHARGE ELECTRICITY BECAUSE IT CONTAINS HIGH VOLTAGE. BEFORE ATTEMPTING TO REMOVE OR REPAIR ANY PCB, UNPLUG THE POWER CORD FROM THE AC SOURCE.

1. Remove the Anode Cap.
(Refer to REMOVAL OF ANODE CAP)
2. Disconnect the following connectors:
(CP801B, CP802B, CP803 and CP806).
3. Remove the CRT PCB in the direction of arrow.



1-3: TV/DVD/VCR BLOCK (Refer to Fig. 1-3)

1. Remove the 2 screws (1).
2. Disconnect the following connectors:
(CP353, CP404 and CP1704).
3. Remove the TV/DVD/VCR Block in the direction of arrow.

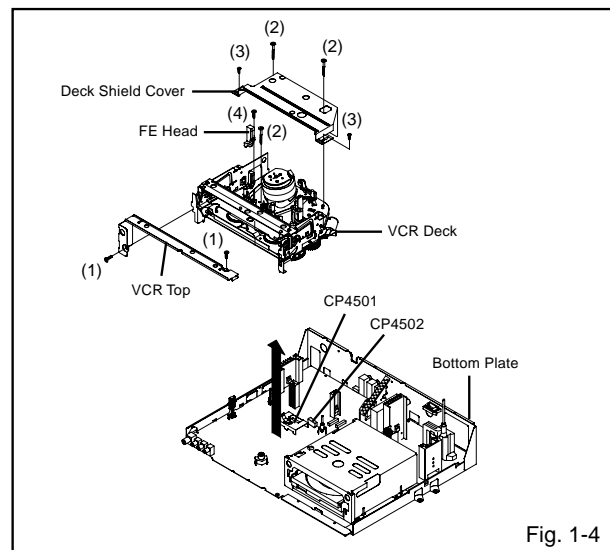


1-4: VCR DECK (Refer to Fig. 1-4)

NOTE

Do not remove the cable at the FE Head section. The FE Head may be damaged if you remove the cable by force.

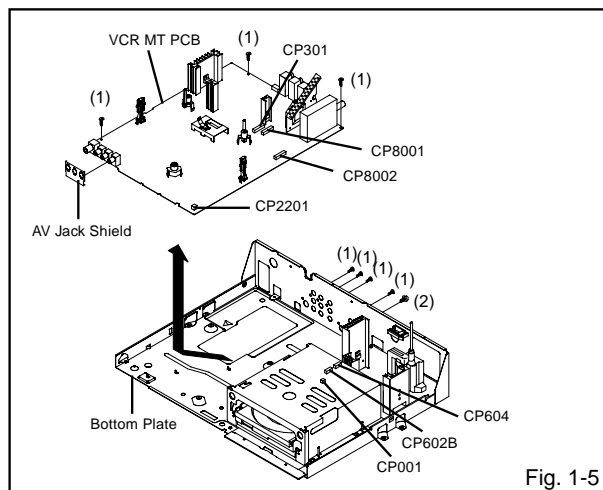
1. Remove the 2 screws (1).
2. Remove the VCR Top.
3. Move the Cassette Holder Ass'y to the back side.
4. Remove the 3 screws (2).
5. Remove the 2 screws (3).
6. Remove the Deck Shield Cover.
7. Remove the screw (4).
8. Remove the FE Head.
9. Disconnect the following connectors:
(CP4501 and CP4502).
10. Remove the VCR Deck in the direction of arrow.



DISASSEMBLY INSTRUCTIONS

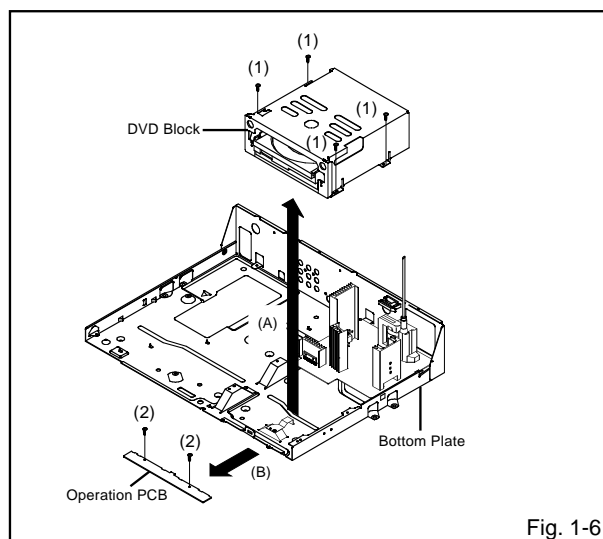
1-5: VCR MT PCB (Refer to Fig. 1-5)

1. Remove the 7 screws (1).
2. Remove the screw (2).
3. Remove the AV Jack Shield.
4. Disconnect the following connectors:
(CP001, CP301, CP602B, CP604, CP2201, CP8001 and CP8002).
5. Remove the VCR MT PCB in the direction of arrow.



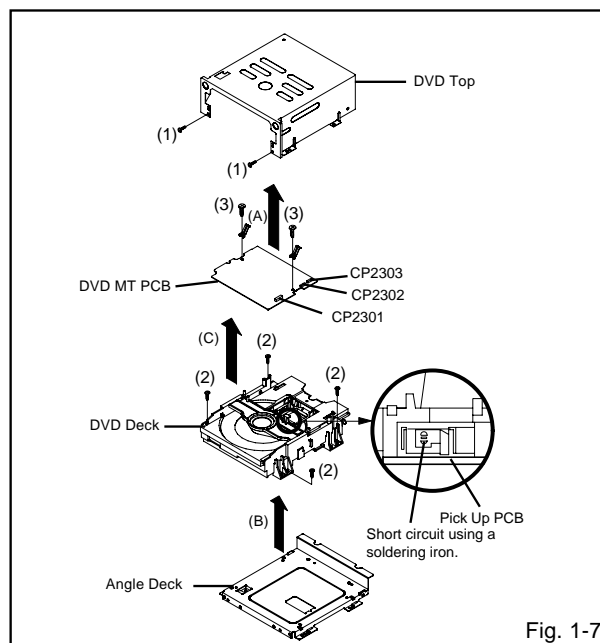
1-6: DVD BLOCK/OPERATION PCB (Refer to Fig. 1-6)

1. Remove the 4 screws (1).
2. Remove the DVD Block in the direction of arrow (A).
3. Remove the 2 screws (2).
4. Remove the Operation PCB in the direction of arrow (B).



1-7: DVD MT PCB/DVD DECK (Refer to Fig. 1-7)

1. Short circuit the position shown in Fig. 1-7 using a soldering iron. If you remove the DVD Deck with no soldering, the Laser may be damaged.
2. Remove the 2 screws (1).
3. Remove the DVD Top in the direction of arrow (A).
4. Remove the 4 screws (2).
5. Remove the DVD Deck in the direction of arrow (B).
6. Disconnect the following connectors:
(CP2301, CP2302 and CP2303).
7. Remove the 2 screws (3).
8. Remove the DVD MT PCB in the direction of arrow (C).



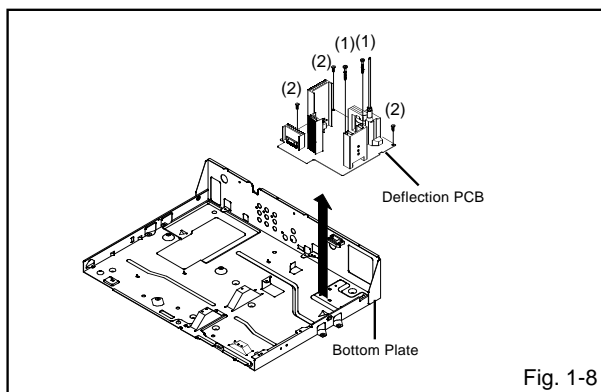
NOTE

1. Before your operation, please read "PREPARATION OF SERVICING".
2. Use the Lead Free solder.
3. Manual soldering conditions
 - Soldering temperature: $320 \pm 20^{\circ}\text{C}$
 - Soldering time: Within 3 seconds
 - Soldering combination: Sn-3.0Ag-0.5Cu
4. When Soldering/Removing of solder, use the drawing equipment over the Pick Up Unit to keep the Flux smoke away from it.
5. When installing the DVD Deck, remove all the soldering on the short circuit position after the connection of Pick Up PCB and DVD MT PCB connector.

DISASSEMBLY INSTRUCTIONS

1-8: DEFLECTION PCB (Refer to Fig. 1-8)

1. Remove the 2 screws (1).
2. Remove the 3 screws (2).
3. Remove the Deflection PCB in the direction of arrow.



DISASSEMBLY INSTRUCTIONS

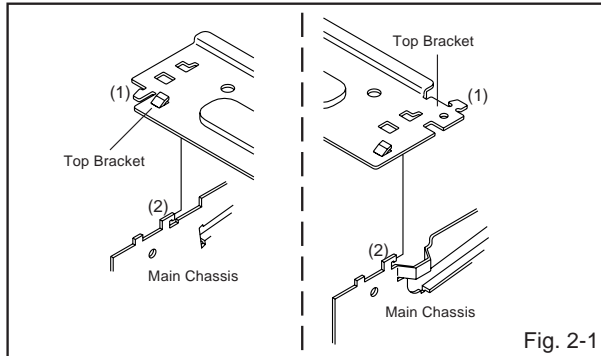
2. REMOVAL OF VCR DECK PARTS

2-1: TOP BRACKET (Refer to Fig. 2-1)

1. Extend the 2 supports (1).
2. Slide the 2 supports (2) and remove the Top Bracket.

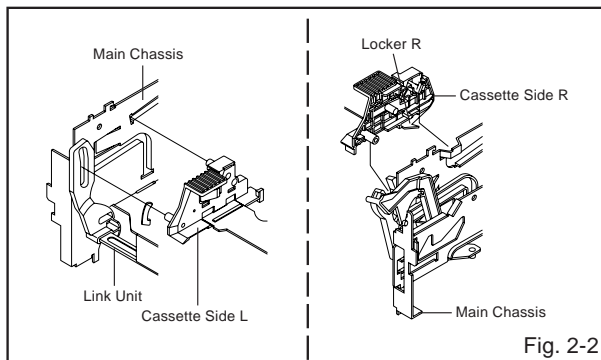
NOTE

1. After installation of the Top Bracket, bend the support (1) so that the Top Bracket is fixed.



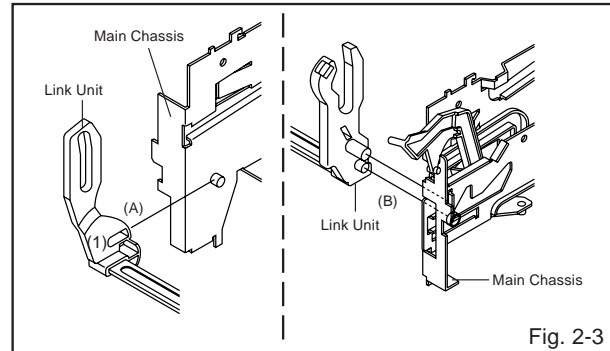
2-2: CASSETTE HOLDER ASS'Y (Refer to Fig. 2-2)

1. Move the Cassette Holder Ass'y to the front side.
2. Push the Locker R to remove the Cassette Side R.
3. Remove the Cassette Side L.



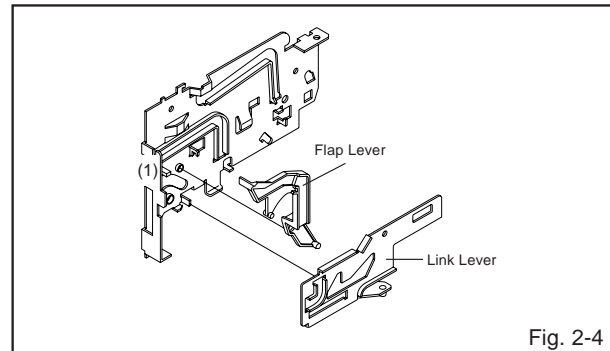
2-3: LINK UNIT (Refer to Fig. 2-3)

1. Set the Link Unit to the Eject position.
2. Unlock the support (1).
3. Remove the (A) side of the Link Unit first, then remove the (B) side.



2-4: LINK LEVER/FLAP LEVER (Refer to Fig. 2-4)

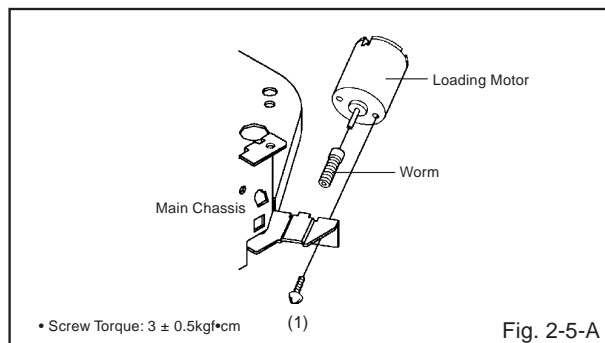
1. Extend the support (1).
2. Remove the Link Lever.
3. Remove the Flap Lever.



DISASSEMBLY INSTRUCTIONS

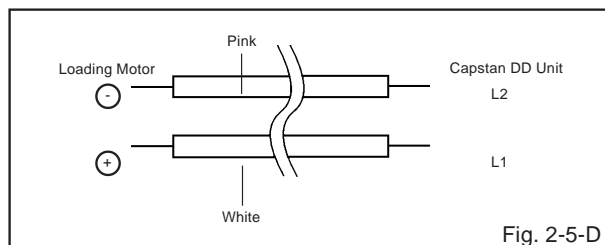
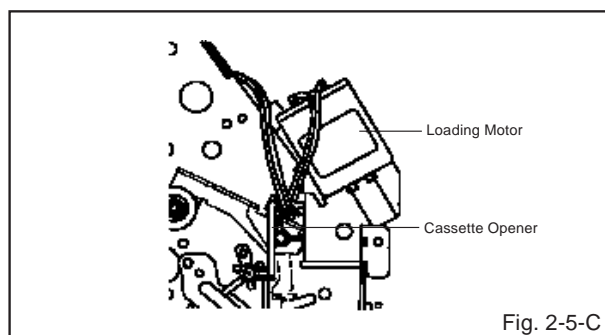
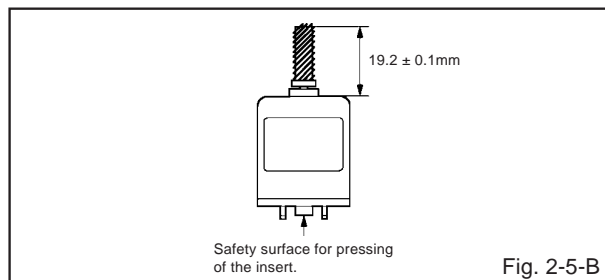
2-5: LOADING MOTOR/WORM (Refer to Fig. 2-5-A)

1. Remove the screw (1).
2. Remove the Loading Motor.
3. Remove the Worm.



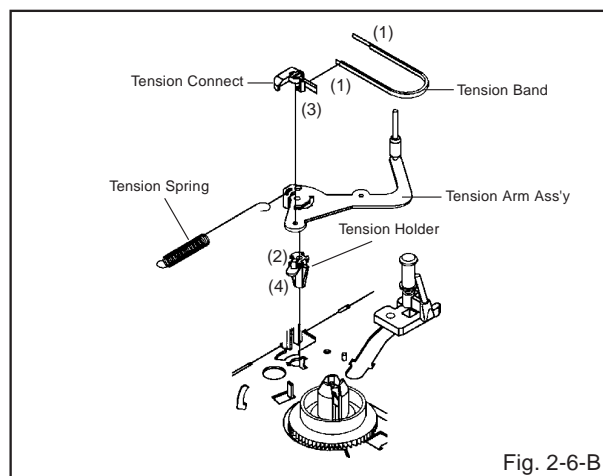
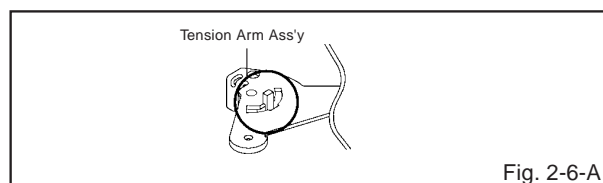
NOTE

1. In case of the Worm installation, check if the value of the Fig. 2-5-B is correct.
2. In case of the Loading Motor installation, hook the wire on the Cassette Opener as shown Fig. 2-5-C.
3. When installing the wires between Capstan DD Unit and Loading Motor, connect them correctly as shown Fig. 2-5-D.



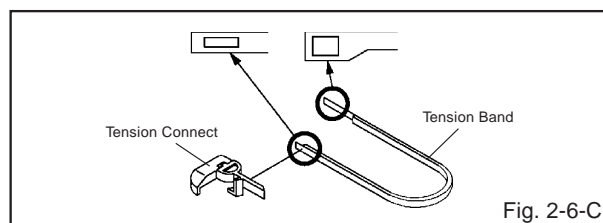
2-6: TENSION ASS'Y (Refer to Fig. 2-6-B)

1. Turn the Pinch Roller Cam clockwise so that the Tension Holder hook is set to the position of Fig. 2-6-A to move the Tension Arm Ass'y.
2. Remove the Tension Spring.
3. Unlock the 2 supports (1) and remove the Tension Band.
4. Unlock the support (2) and remove the Tension Arm Ass'y.
5. Unlock the support (3) and remove the Tension Connect.
6. Float the hook (4) and turn it clockwise then remove the Tension Holder.

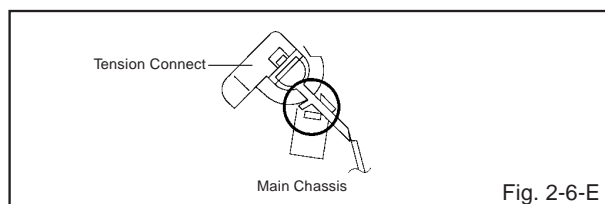
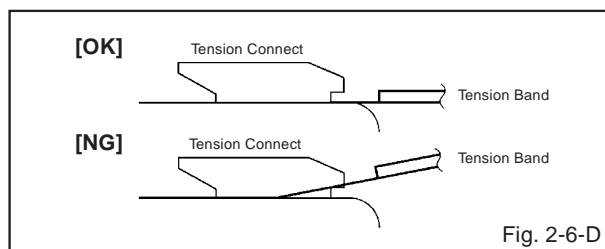


NOTE

1. In case of the Tension Band installation, note the direction of the installation. (Refer to Fig. 2-6-C)
2. In case of the Tension Band installation, install correctly as Fig. 2-6-D.
3. In case of the Tension Connect installation, install as the circled section of Fig. 2-6-E.

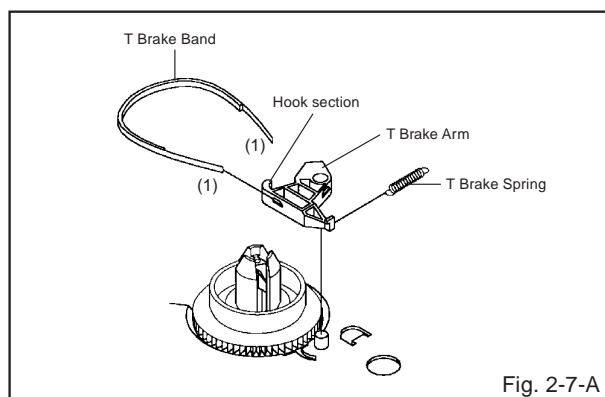


DISASSEMBLY INSTRUCTIONS



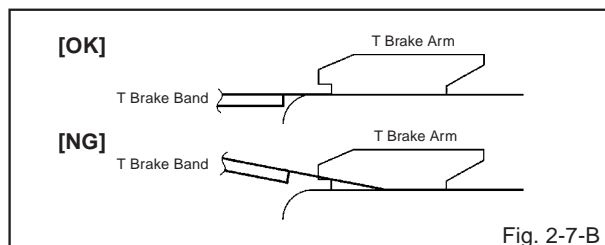
2-7: T BRAKE ARM/T BRAKE BAND (Refer to Fig. 2-7-A)

1. Remove the T Brake Spring.
2. Turn the T Brake Arm clockwise and bend the hook section to remove it.
3. Unlock the 2 supports (1) and remove the T Brake Band.



NOTE

1. In case of the T Brake Band installation, install correctly as Fig. 2-7-B.

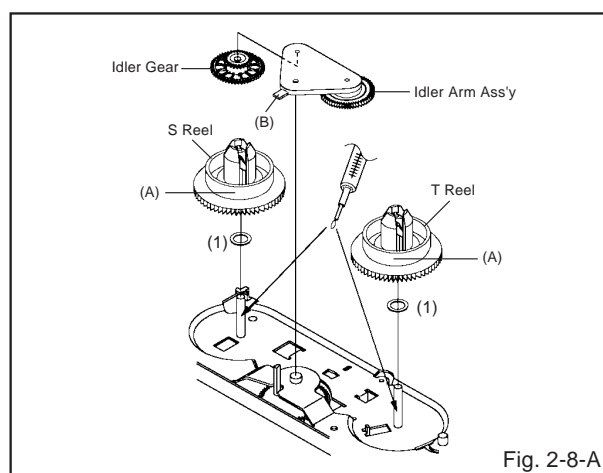


2-8: S REEL/T REEL/IDLER ARM ASS'Y/IDLER GEAR (Refer to Fig. 2-8-A)

1. Remove the S Reel and T Reel.
2. Remove the 2 Polyslider Washers (1).
3. Remove the Idler Arm Ass'y and Idler Gear.

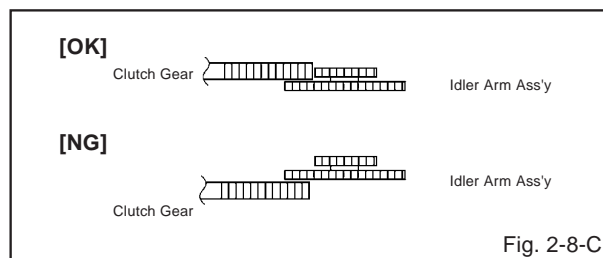
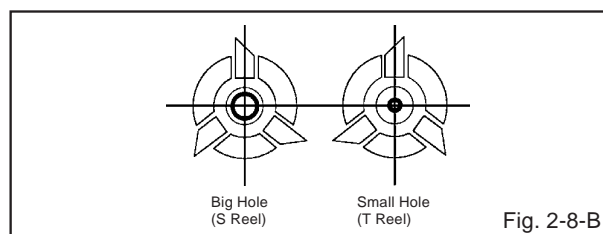
NOTE

1. Take care not to damage the gears of the S Reel and T Reel.
2. The Polyslider Washer may on the back of the reel.
3. Take care not to damage the shaft.
4. Do not touch section "A" of S Reel and T Reel. (Use gloves.) (Refer to Fig. 2-8-A) Touching may leave stains on section "A".
5. When you install the reel, clean the shaft and grease it. (If you do not grease, noise may be heard in FF/REW mode.)
6. After installing the reel, adjust the height of the reel. (Refer to MECHANICAL ADJUSTMENT)



NOTE

1. In case of the S Reel and T Reel installation, check if the correct parts are installed. (Refer to Fig. 2-8-B)
2. In case of the Idler Arm Ass'y installation, install correctly as Fig. 2-8-C. And also set it so that the section "B" of Fig. 2-8-A is placed under the Main Chassis tab.



DISASSEMBLY INSTRUCTIONS

2-9: CASSETTE OPENER/PINCH ROLLER BLOCK/P5 ARM ASS'Y (Refer to Fig. 2-9-A)

1. Unlock the support (1) and remove the Cassette Opener.
2. Remove the Pinch Roller Block and P5 Arm Ass'y.

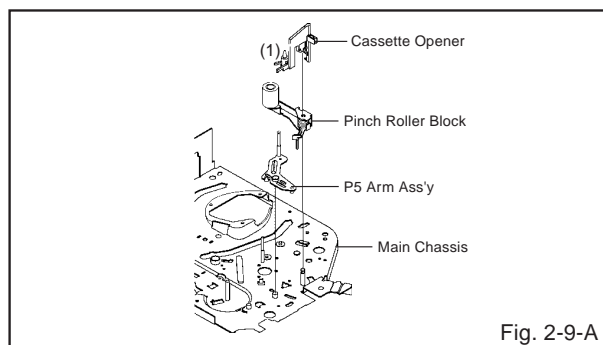


Fig. 2-9-A

NOTE

1. Do not touch the Pinch Roller. (Use gloves.)
2. In case of the Pinch Roller Block and the Pinch Roller Cam installation, install correctly as Fig. 2-9-B.

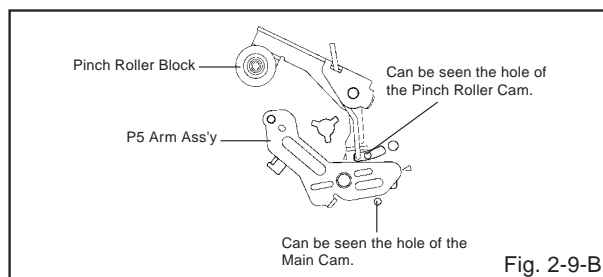


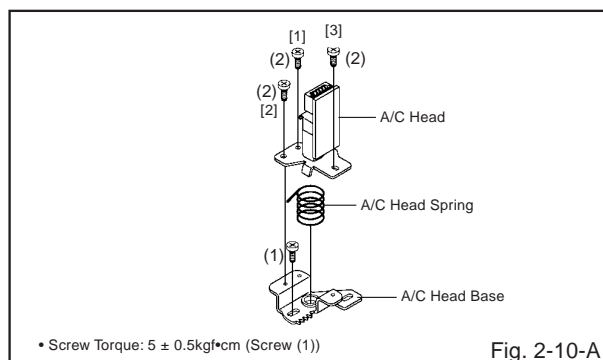
Fig. 2-9-B

2-10: A/C HEAD (Refer to Fig. 2-10-A)

1. Remove the screw (1).
2. Remove the A/C Head Base.
3. Remove the 3 screws (2).
4. Remove the A/C Head and A/C Head Spring.

NOTE

1. Do not touch the A/C Head. (Use gloves.)
2. When you install the A/C Head Spring, install as shown in Fig. 2-10-B.
3. When you install the A/C Head, tighten the screw [1] first, then tighten the screw [2], finally tighten the screw [3].



• Screw Torque: $5 \pm 0.5 \text{ kgf}\cdot\text{cm}$ (Screw (1))

Fig. 2-10-A

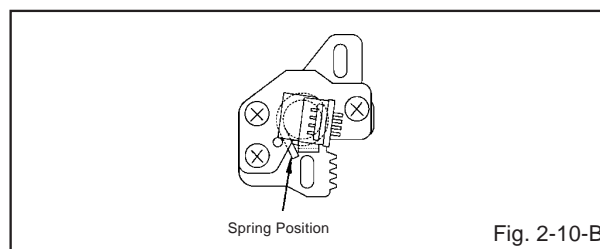
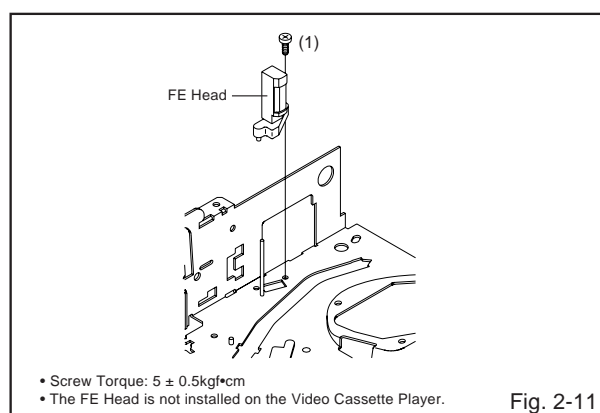


Fig. 2-10-B

2-11: FE HEAD (RECORDER ONLY) (Refer to Fig. 2-11)

1. Remove the screw (1).
2. Remove the FE Head.



- Screw Torque: $5 \pm 0.5 \text{ kgf}\cdot\text{cm}$
- The FE Head is not installed on the Video Cassette Player.

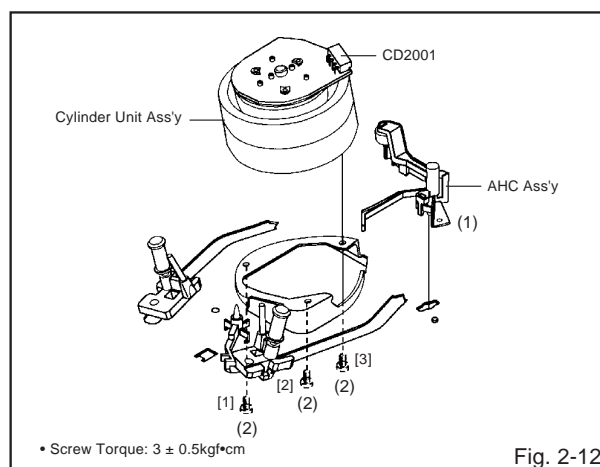
Fig. 2-11

2-12: CYLINDER UNIT ASS'Y (Refer to Fig. 2-12)

1. Unlock the support (1) and remove the AHC Ass'y.
2. Disconnect the following connector: (CD2001).
3. Remove the 3 screws (2).
4. Remove the Cylinder Unit Ass'y.

NOTE

1. When you install the Cylinder Unit Ass'y, tighten the screws from [1] to [3] in order while pulling the Ass'y toward the left front direction.



• Screw Torque: $3 \pm 0.5 \text{ kgf}\cdot\text{cm}$

Fig. 2-12

DISASSEMBLY INSTRUCTIONS

2-13: CAPSTAN DD UNIT (Refer to Fig. 2-13)

1. Remove the Capstan Belt.
2. Remove the screw (1).
3. Remove the Capstan Holder.
4. Remove the 3 screws (2).
5. Remove the Capstan DD Unit.

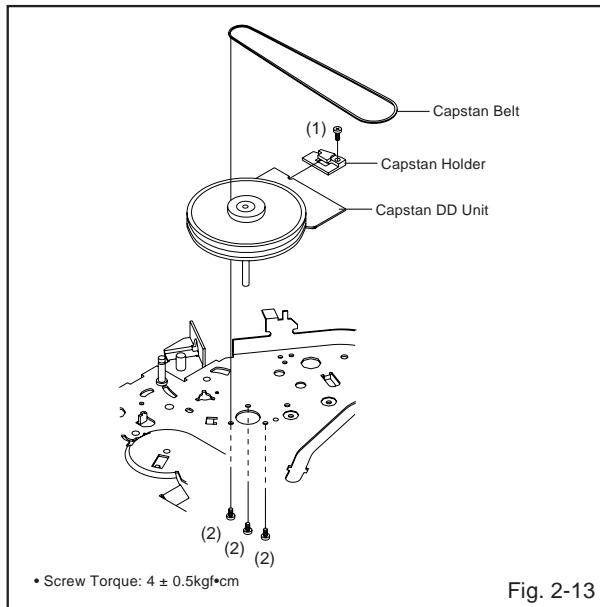


Fig. 2-13

2-14: MAIN CAM/PINCH ROLLER CAM/Joint GEAR (Refer to Fig. 2-14-A)

1. Remove the E-Ring (1), then remove the Main Cam.
2. Remove the E-Ring (2), then remove the Pinch Roller Cam and Joint Gear.

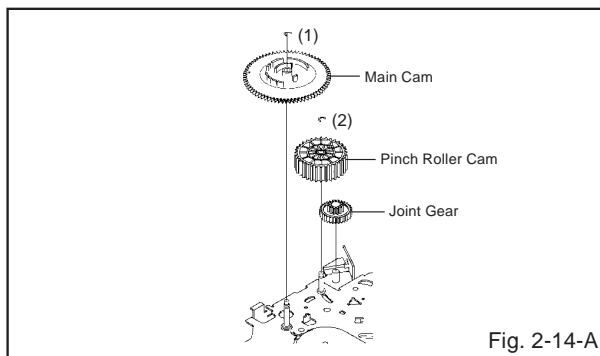


Fig. 2-14-A

NOTE

1. In case of the Pinch Roller Cam and Main Cam installation, install them as shown in the circled section of Fig. 2-14-B so that the markers meet. (Refer to Fig. 2-14-B) And also can be seen the Main Chassis hole through the Main Cam maker hole.

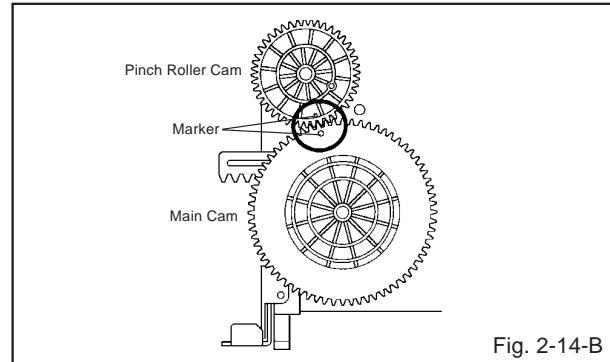


Fig. 2-14-B

2-15: LOADING GEAR S/T UNIT (Refer to Fig. 2-15-A)

1. Remove the E-Ring (1) and remove the Main Loading Gear.
2. Remove the Main Rod, Tension Lever, Loading Arm S Unit and Loading Arm T Unit.

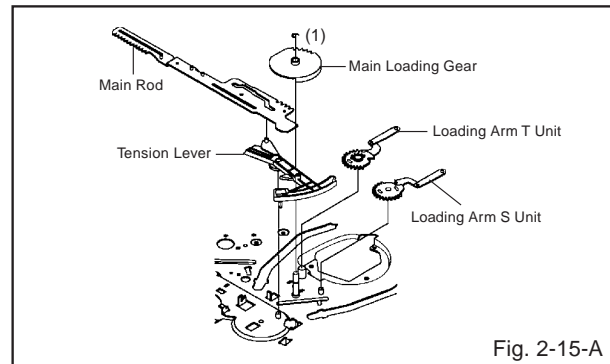
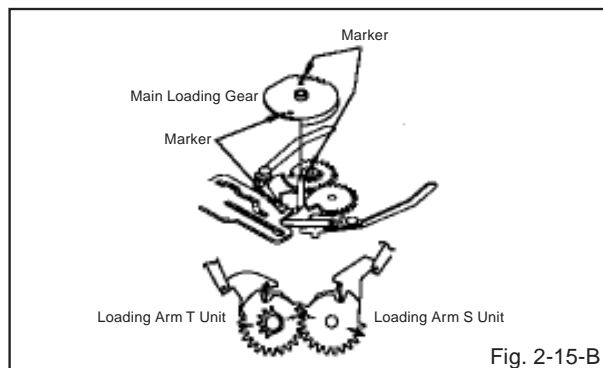


Fig. 2-15-A

DISASSEMBLY INSTRUCTIONS

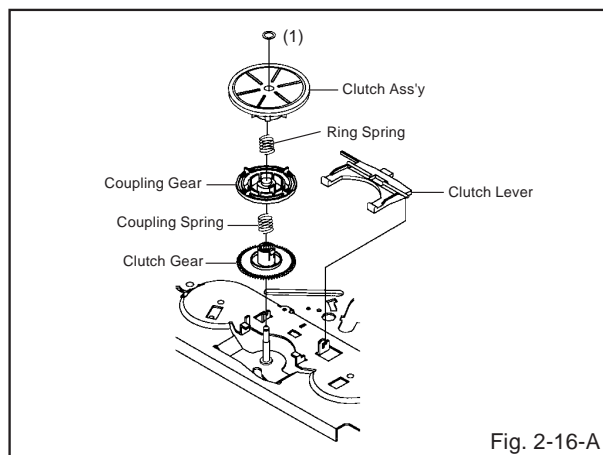
NOTE

1. When you install the Loading Arm S Unit, Loading Arm T Unit and Main Loading Gear, align each marker. (Refer to Fig. 2-15-B)



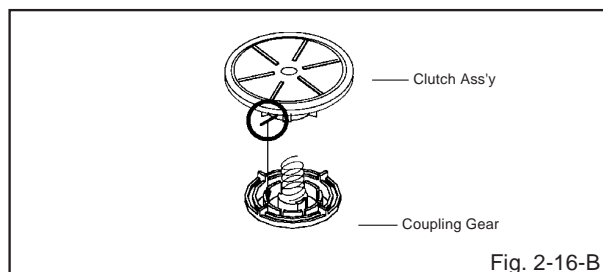
2-16: CLUTCH ASS'Y/RING SPRING/CLUTCH LEVER/CLUTCH GEAR (Refer to Fig. 2-16-A)

1. Remove the Polyslider Washer (1).
2. Remove the Clutch Ass'y and Ring Spring.
3. Remove the Clutch Lever.
4. Remove the Coupling Gear, Coupling Spring and Clutch Gear.



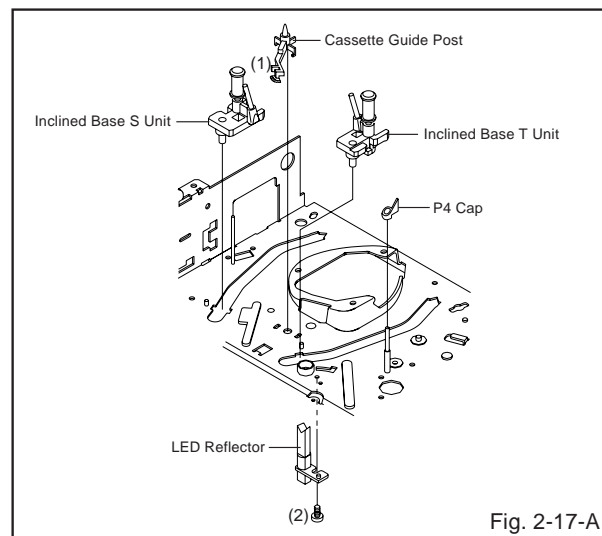
NOTE

1. In case of the Clutch Ass'y installation, install it with inserting the spring of the Clutch Ass'y into the dent of the Coupling Gear. (Refer to Fig. 2-16-B)



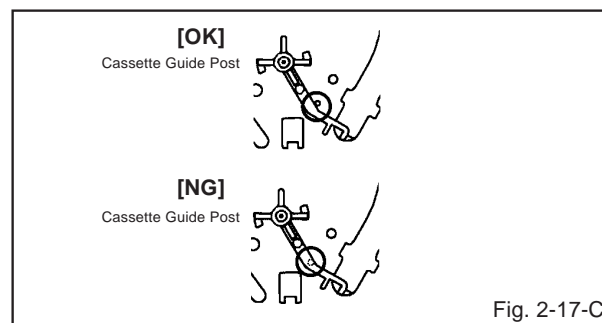
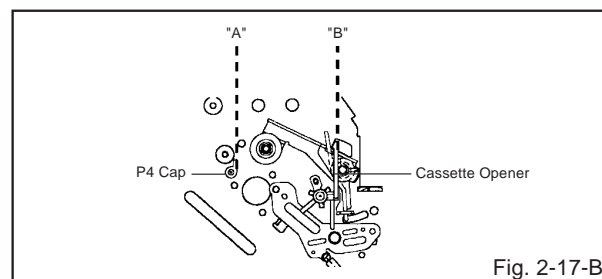
2-17: CASSETTE GUIDE POST/INCLINED BASE S/T UNIT/P4 CAP/LED REFLECTOR (Refer to Fig. 2-17-A)

1. Remove the P4 Cap.
2. Unlock the support (1) and remove the Cassette Guide Post.
3. Remove the Inclined Base S/T Unit.
4. Remove the screw (2).
5. Remove the LED Reflector.



NOTE

1. Do not touch the roller of Guide Roller.
2. In case of the P4 Cap installation, install it with parallel for "A" and "B" of Fig. 2-17-B.
3. In case of the Cassette Guide Post installation, install correctly as the circled section of Fig. 2-17-C.



DISASSEMBLY INSTRUCTIONS

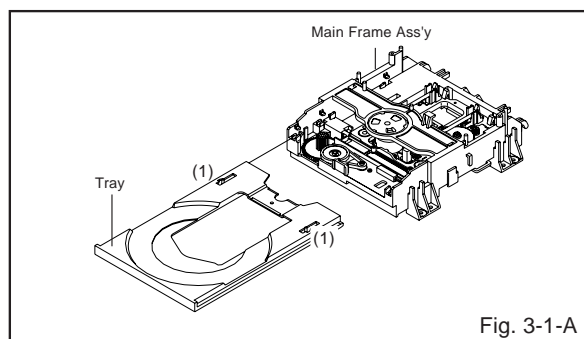
3. REMOVAL OF DVD DECK PARTS

NOTE

1. Disassemble only the DVD DECK PARTS parts listed here. Minute adjustments are needed if the disassembly is done. If the repair is needed except listed parts, replace the DVD MECHA ASS'Y.

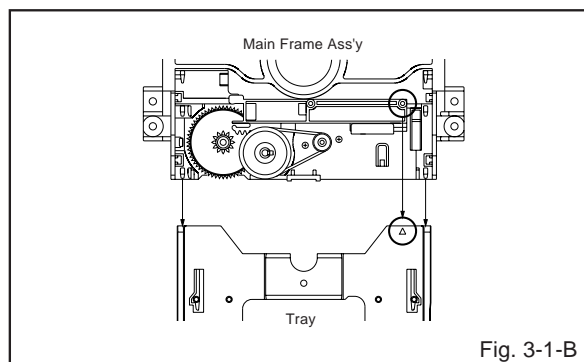
3-1: TRAY (Refer to Fig. 3-1-A)

1. Set the Tray opened. (Refer to the DISC REMOVAL METHOD AT NO POWER SUPPLY)
2. Unlock the 2 supports (1) and remove the Tray.



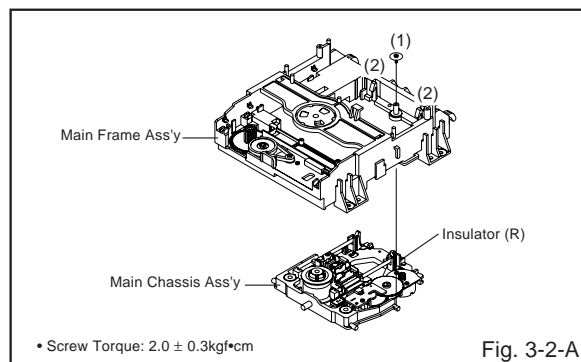
NOTE

1. In case of the Tray installation, install them as the circled section of Fig. 3-1-B so that the each markers are met.



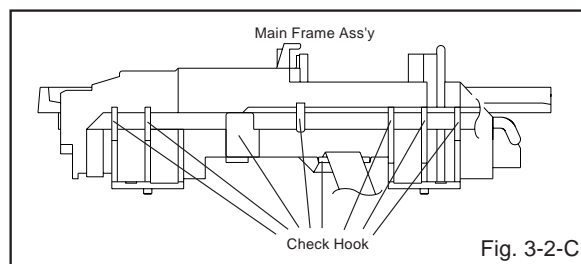
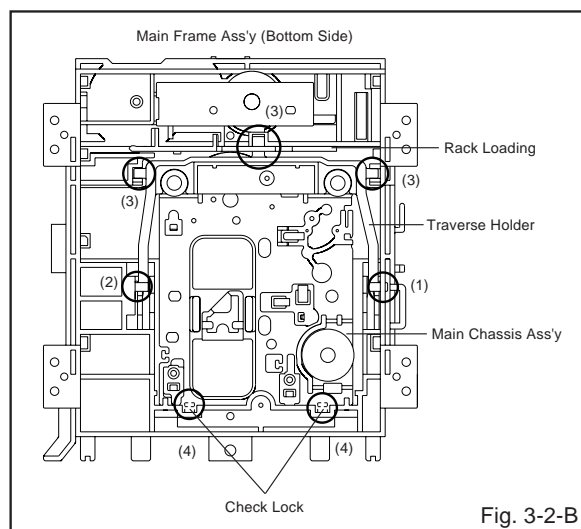
3-2: MAIN CHASSIS ASS'Y (Refer to Fig. 3-2-A)

1. Remove the screw (1).
2. Unlock the 2 supports (2).
3. Remove the Insulator (R) from the Main Frame Ass'y.
4. Remove the Main Chassis Ass'y.



NOTE

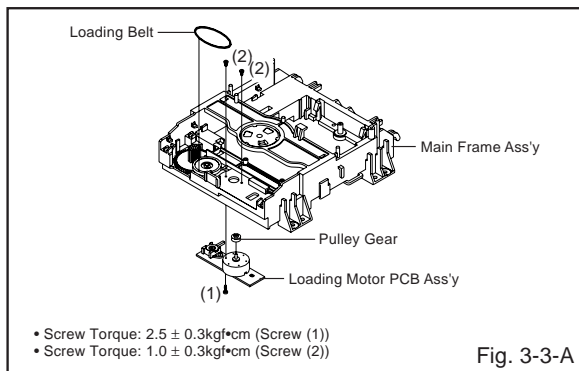
1. In case of the Main Chassis Ass'y, install it from (1) to (4) in order. (Refer to Fig. 3-2-B)
2. In case of the Main Chassis Ass'y installation, hook the wire on the Main Frame Ass'y as shown Fig. 3-2-C.



DISASSEMBLY INSTRUCTIONS

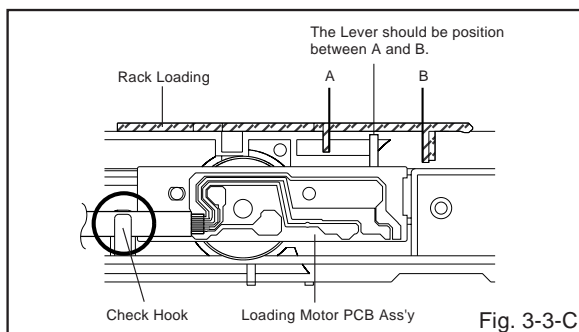
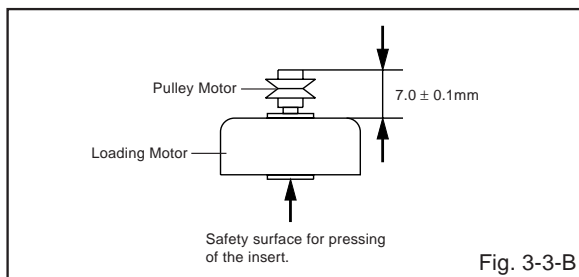
3-3: LOADING MOTOR PCB ASS'Y/ LOADING BELT (Refer to Fig. 3-3-A)

1. Remove the Loading Belt.
2. Remove the screw (1).
3. Remove the 2 screws (2).
4. Remove the Loading Motor PCB Ass'y.
5. Remove the Pulley Gear.



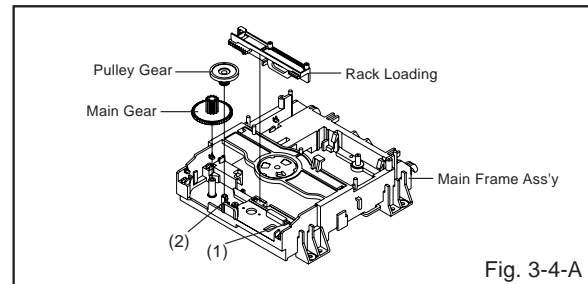
NOTE

1. In case of the Pulley Motor installation, check if the value of the Fig. 3-3-B is correct.
2. When installing the Loading Motor PCB Ass'y, install it correctly as Fig. 3-3-C.
3. In case of the Loading Motor PCB Ass'y installation, hook the wire on the Main Frame Ass'y as shown Fig. 3-3-C.



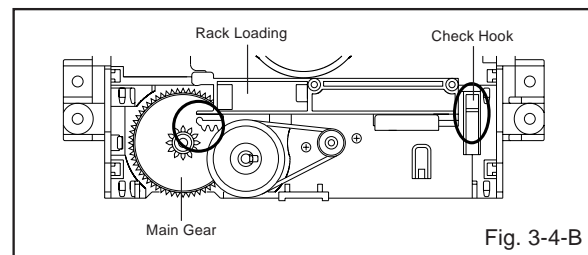
3-4: RACK LOADING/MAIN GEAR/PULLEY GEAR (Refer to Fig. 3-4-A)

1. Press down the catcher (1) and slide the Rack Loading.
2. Unlock the support (2) and remove the Pulley Gear.
3. Remove the Main Gear.



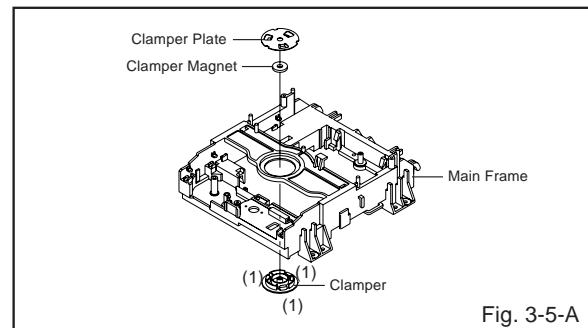
NOTE

1. In case of the Rack Loading installation, do not mesh it to the Main Gear as shown the Fig. 3-4-B.



3-5: CLAMPER ASS'Y (Refer to Fig. 3-5-A)

1. Press the Clamper and rotate the Clamper Plate clockwise, then unlock the 3 supports (1).
2. Remove the Clamper Plate, Clamper Magnet and Clamper.



NOTE

1. In case of the Clamper Ass'y installation, install correctly as Fig. 3-5-B.

DISASSEMBLY INSTRUCTIONS

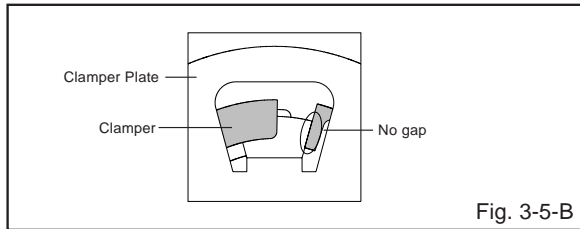


Fig. 3-5-B

3-6: TRAVERSE HOLDER/INSULATOR (F)/INSULATOR (R) (Refer to Fig. 3-6-A)

1. Remove the Traverse Holder.
2. Remove the 2 Insulator (F).
3. Remove the Insulator (R).

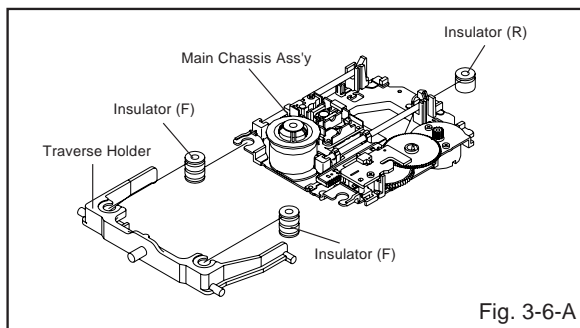


Fig. 3-6-A

NOTE

1. In case of the Insulator (F) installation, install correctly as Fig. 3-6-B.
2. In case of the Insulator (R) installation, install correctly as Fig. 3-6-C.

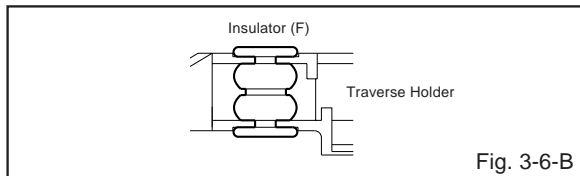


Fig. 3-6-B

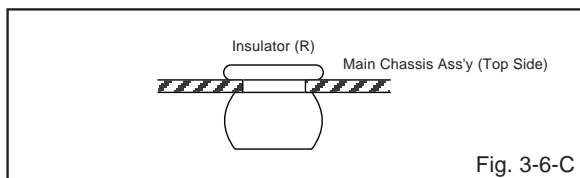


Fig. 3-6-C

3-7: SWITCH PCB ASS'Y/MIDDLE GEAR/FEED MOTOR (Refer to Fig. 3-7-A)

1. Remove the screw (1).
2. Remove the Switch PCB Ass'y.
3. Unlock the support (2).
4. Remove the Middle Gear.
5. Remove the 2 screws (3).
6. Remove the Feed Motor.
7. Remove the Motor Gear.

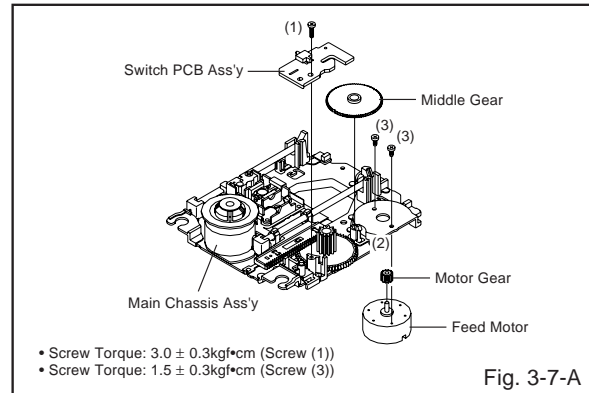


Fig. 3-7-A

NOTE

1. In case of the Motor Gear installation, check if the value of the Fig. 3-7-B is correct.
2. When installing the wire of the Switch PCB Ass'y, install it correctly as Fig. 3-7-C.
3. After the assembly of the Main Chassis Ass'y, hook the wire on the Main Chassis Ass'y as shown Fig. 3-7-D.

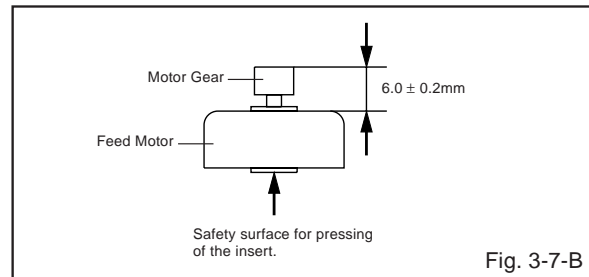


Fig. 3-7-B

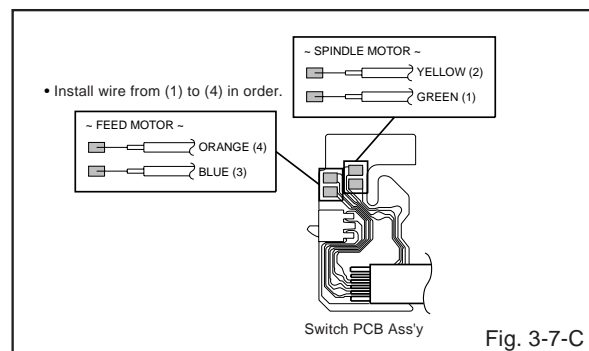


Fig. 3-7-C

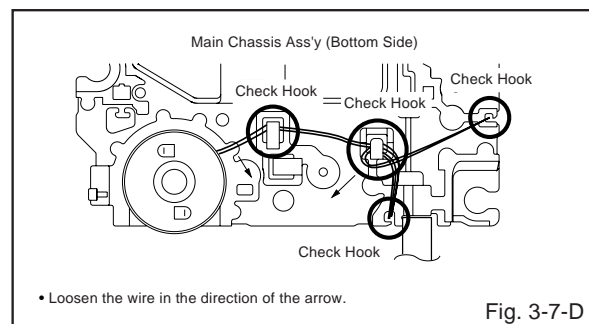


Fig. 3-7-D

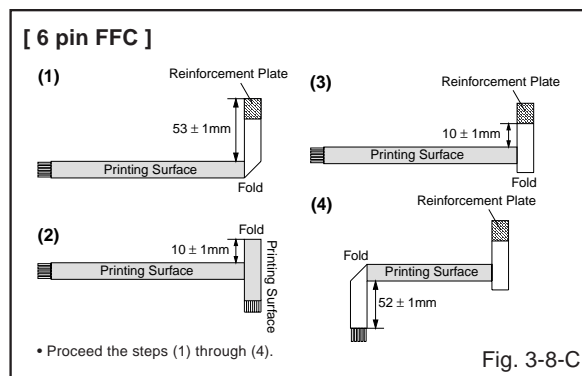
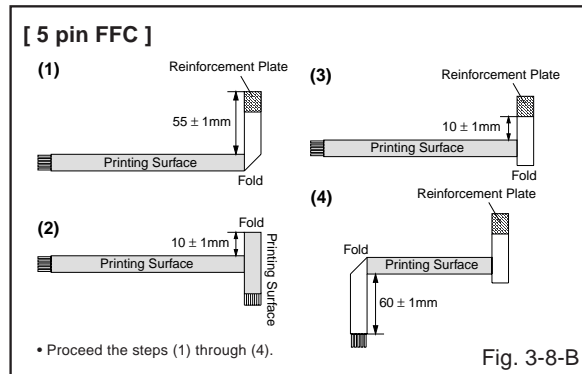
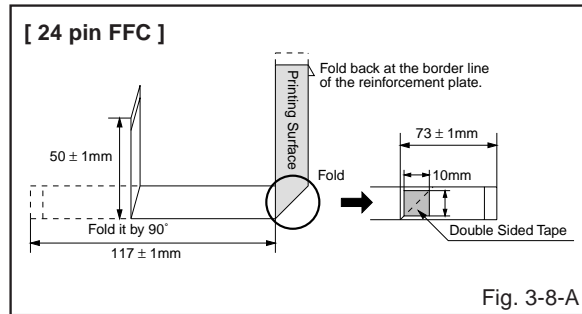
DISASSEMBLY INSTRUCTIONS

3-8: FFC WIRE HANDLING

1. When installing the FFC, fold it correctly and install it as shown from Fig. 3-8-A to Fig. 3-8-C.

NOTE

1. Do not make the folding lines except the specified positions for the FFC.



DISASSEMBLY INSTRUCTIONS

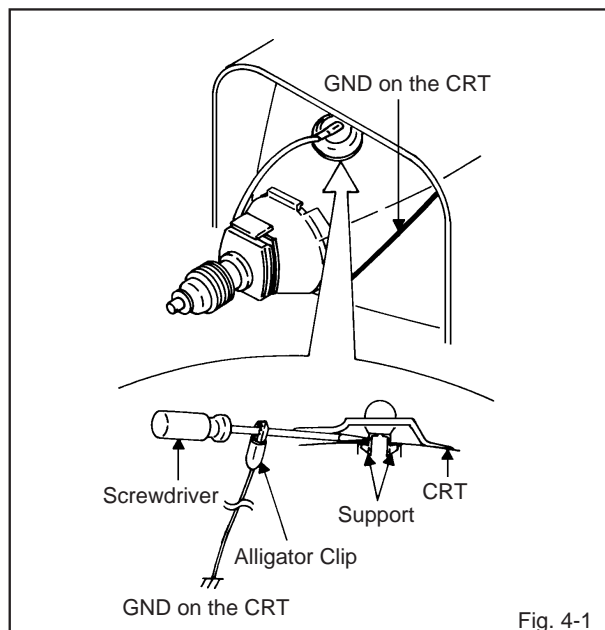
4. REMOVAL OF ANODE CAP

Read the following **NOTED** items before starting work.

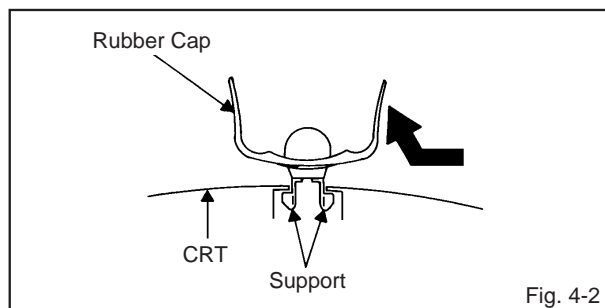
- * After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
- * Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

REMOVAL

1. Follow the steps as follows to discharge the Anode Cap.
(Refer to Fig. 4-1.)
Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground. While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver. A cracking noise will be heard as the voltage is discharged.



2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support.
(Refer to Fig. 4-2.)



3. After one side is removed, pull in the opposite direction to remove the other.

NOTE

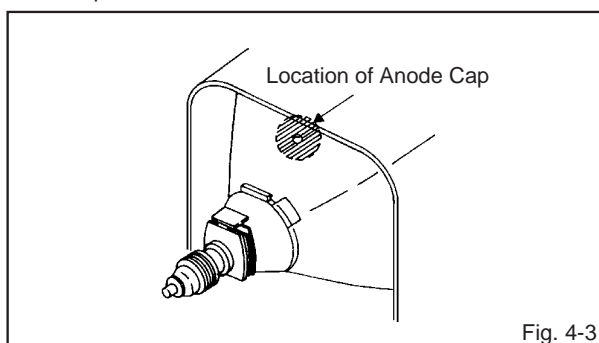
Take care not to damage the Rubber Cap.

INSTALLATION

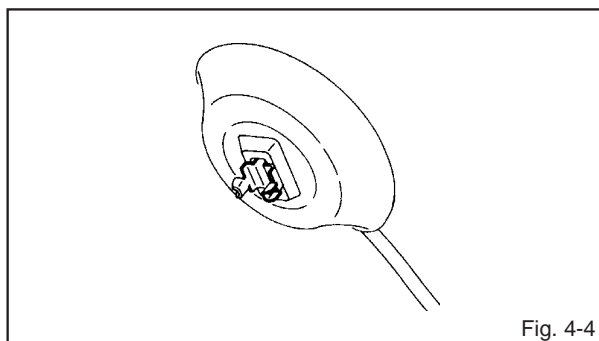
1. Clean the spot where the cap was located with a small amount of alcohol. (Refer to Fig. 4-3.)

NOTE

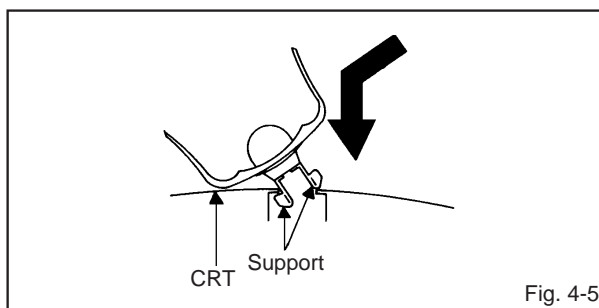
Confirm that there is no dirt, dust, etc. at the spot where the cap was located.



2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. (Refer to Fig. 4-4.)



4. Insert one end of the Anode Support into the anode button, then the other as shown in Fig. 4-5.



5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

DISASSEMBLY INSTRUCTIONS

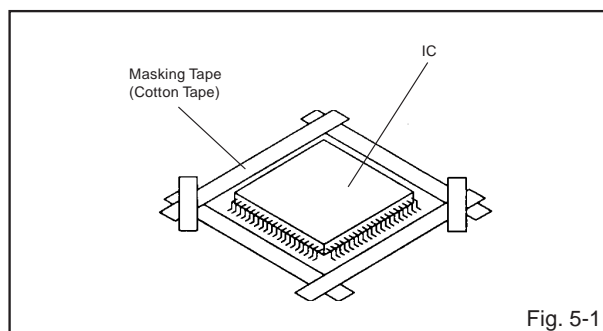
5. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

1. Put Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage. (Refer to Fig. 5-1.)

NOTE

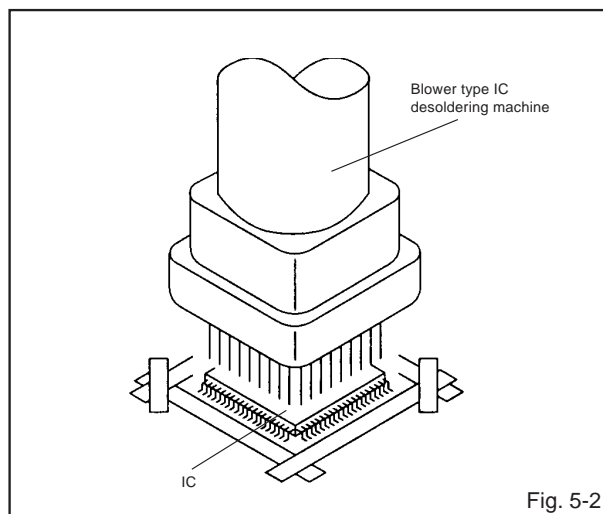
Masking is carried out on all the parts located within 10 mm distance from IC leads.



2. Heat the IC leads using a blower type IC desoldering machine. (Refer to Fig. 5-2.)

NOTE

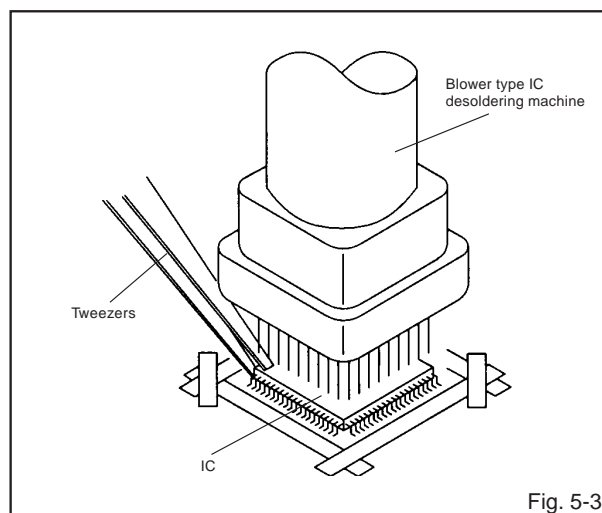
Do not rotate or move the IC back and forth, until IC can move back and forth easily after desoldering the leads completely.



3. When IC starts moving back and forth easily after desoldering completely, pickup the corner of the IC using a tweezers and remove the IC by moving with the IC desoldering machine. (Refer to Fig. 5-3.)

NOTE

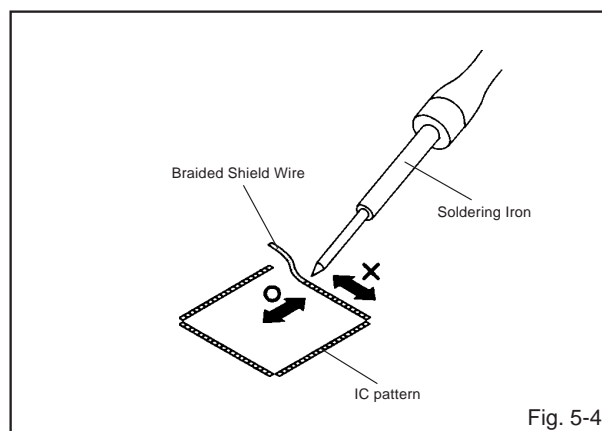
Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.



4. Peel off the Masking Tape.
5. Absorb the solder left on the pattern using the Braided Shield Wire. (Refer to Fig. 5-4.)

NOTE

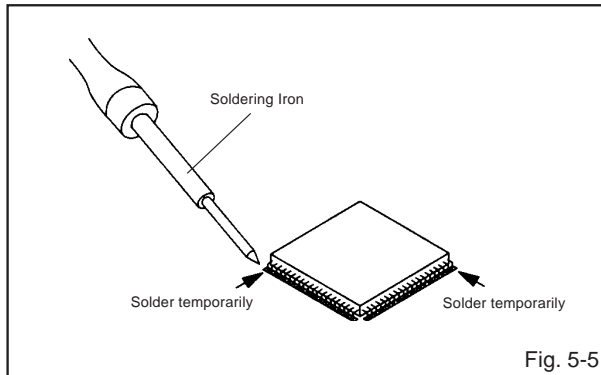
Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.



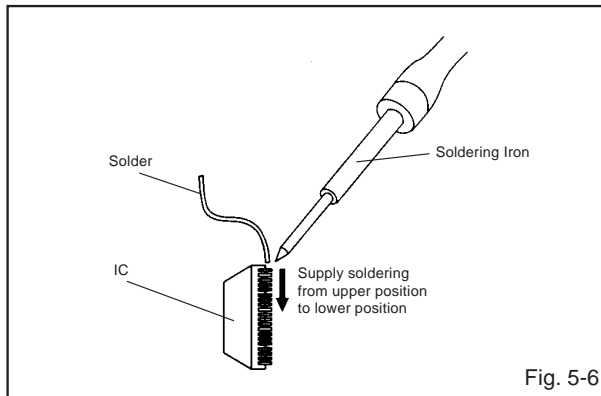
DISASSEMBLY INSTRUCTIONS

INSTALLATION

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. (Refer to Fig. 5-5.)



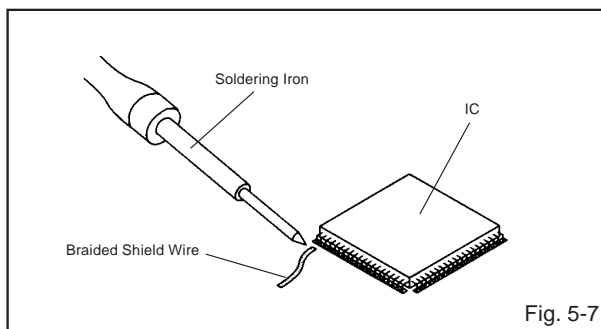
2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. (Refer to Fig. 5-6.)



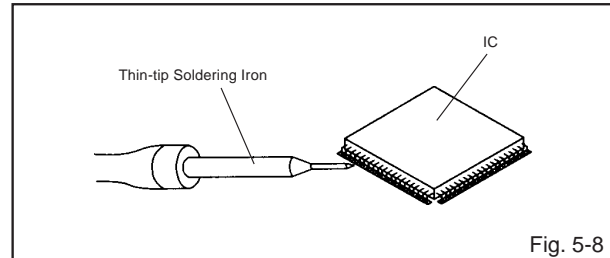
3. Absorb the solder left on the lead using the Braided Shield Wire. (Refer to Fig. 5-7.)

NOTE

Do not absorb the solder to excess.



4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. (Refer to Fig. 5-8.)



5. Finally, confirm the soldering status on four sides of the IC using a magnifying glass.

Confirm that no abnormality is found on the soldering position and installation position of the parts around the IC. If some abnormality is found, correct by resoldering.

NOTE

When the IC leads are bent during soldering and/or repairing, do not repair the bending of leads. If the bending of leads are repaired, the pattern may be damaged. So, always be sure to replace the IC in this case.

KEY TO ABBREVIATIONS

A	A/C	: Audio/Control	H.SW	: Head Switch
	ACC	: Automatic Color Control	Hz	: Hertz
	AE	: Audio Erase	I IC	: Integrated Circuit
	AFC	: Automatic Frequency Control	IF	: Intermediate Frequency
	AFT	: Automatic Fine Tuning	IND	: Indicator
	AFT DET	: Automatic Fine Tuning Detect	INV	: Inverter
	AGC	: Automatic Gain Control	K KIL	: Killer
	AMP	: Amplifier	L L	: Left
	ANT	: Antenna	LED	: Light Emitting Diode
	A.PB	: Audio Playback	LIMIT AMP	: Limiter Amplifier
	APC	: Automatic Phase Control	LM, LDM	: Loading Motor
	ASS'Y	: Assembly	LP	: Long Play
	AT	: All Time	L.P.F	: Low Pass Filter
	AUTO	: Automatic	LUMI.	: Luminance
	A/V	: Audio/Video	M M	: Motor
B	BGP	: Burst Gate Pulse	MAX	: Maximum
	BOT	: Beginning of Tape	MINI	: Minimum
	BPF	: Bandpass Filter	MIX	: Mixer, mixing
	BRAKE SOL	: Brake Solenoid	MM	: Monostable Multivibrator
	BUFF	: Buffer	MOD	: Modulator, Modulation
	B/W	: Black and White	MPX	: Multiplexer, Multiplex
C	C	: Capacitance, Collector	MS SW	: Mecha State Switch
	CASE	: Cassette	N NC	: Non Connection
	CAP	: Capstan	NR	: Noise Reduction
	CARR	: Carrier	O OSC	: Oscillator
	CH	: Channel	OPE	: Operation
	CLK	: Clock	P PB	: Playback
	CLOCK (SY-SE)	: Clock (Syscon to Servo)	PB CTL	: Playback Control
	COMB	: Combination, Comb Filter	PB-C	: Playback-Chrominance
	CONV	: Converter	PB-Y	: Playback-Luminance
	CPM	: Capstan Motor	PCB	: Printed Circuit Board
	CTL	: Control	P. CON	: Power Control
	CYL	: Cylinder	PD	: Phase Detector
	CYL-M	: Cylinder-Motor	PG	: Pulse Generator
	CYL SENS	: Cylinder-Sensor	P-P	: Peak-to Peak
D	DATA (SY-CE)	: Data (Syscon to Servo)	R R	: Right
	dB	: Decibel	REC	: Recording
	DC	: Direct Current	REC-C	: Recording-Chrominance
	DD Unit	: Direct Drive Motor Unit	REC-Y	: Recording-Luminance
	DEMOMD	: Demodulator	REEL BRK	: Reel Brake
	DET	: Detector	REEL S	: Reel Sensor
	DEV	: Deviation	REF	: Reference
E	E	: Emitter	REG	: Regulated, Regulator
	EF	: Emitter Follower	REW	: Rewind
	EMPH	: Emphasis	REV, RVS	: Reverse
	ENC	: Encoder	RF	: Radio Frequency
	ENV	: Envelope	RMC	: Remote Control
	EOT	: End of Tape	RY	: Relay
	EQ	: Equalizer	S S. CLK	: Serial Clock
	EXT	: External	S. COM	: Sensor Common
F	F	: Fuse	S. DATA	: Serial Data
	FBC	: Feed Back Clamp	SEG	: Segment
	FE	: Full Erase	SEL	: Select, Selector
	FF	: Fast Forward, Flipflop	SENS	: Sensor
	FG	: Frequency Generator	SER	: Search Mode
	FL SW	: Front Loading Switch	SI	: Serial Input
	FM	: Frequency Modulation	SIF	: Sound Intermediate Frequency
	FSC	: Frequency Sub Carrier	SO	: Serial Output
	FWD	: Forward	SOL	: Solenoid
G	GEN	: Generator	SP	: Standard Play
	GND	: Ground	STB	: Serial Strobe
H	H.P.F	: High Pass Filter	SW	: Switch

KEY TO ABBREVIATIONS

S	SYNC	:	Synchronization
	SYNC SEP	:	Sync Separator, Separation
T	TR	:	Transistor
	TRAC	:	Tracking
	TRICK PB	:	Trick Playback
	TP	:	Test Point
U	UNREG	:	Unregulated
V	V	:	Volt
	VCO	:	Voltage Controlled Oscillator
	VIF	:	Video Intermediate Frequency
	VP	:	Vertical Pulse, Voltage Display
	V.PB	:	Video Playback
	VR	:	Variable Resistor
	V.REC	:	Video Recording
	VSF	:	Visual Search Fast Forward
	VSR	:	Visual Search Rewind
	VSS	:	Voltage Super Source
	V-SYNC	:	Vertical-Synchronization
	VT	:	Voltage Tuning
X	X'TAL	:	Crystal
Y	Y/C	:	Luminance/Chrominance

SERVICE MODE LIST

This unit is provided with the following SERVICE MODES so you can repair, examine and adjust easily.

To enter to the SERVICE MODE function, press and hold both buttons simultaneously on the main unit and on the remote control for more than the standard time in the appropriate condition. (See below chart.)

Set Condition	Set Key	Remocon Key	Standard Time	Operations
TV mode	VOL. (-) MIN	0	2 sec.	Releasing of V-CHIP PASSWORD.
TV mode	VOL. (-) MIN	1	2 sec.	Initialization of factory data. NOTE: Do not use this for data normal servicing. If you set factory initialization, the memories are reset such as the clock setting, the channel setting, the POWER ON total hours, and PLAY/REC total hours.
TV mode	VOL. (-) MIN	2	2 sec.	Horizontal position adjustment of OSD. NOTE: Also can be adjusted by using the Adjustment MENU. Refer to the "ELECTRICAL ADJUSTMENT" (OSD HORIZONTAL).
VCR mode (Playback)	VOL. (-) MIN	3	2 sec.	Adjust the PG SHIFTER automatically. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VCR mode (Playback)	VOL. (-) MIN	4	2 sec.	Adjust the PG SHIFTER manually. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VCR mode (Playback)	VOL. (-) MIN	5	2 sec.	Adjusting of the Tracking to the center position.
TV mode	VOL. (-) MIN	6	2 sec.	Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
ALL mode	VOL. (-) MIN	8	2 sec.	Check of the SUM DATA, POWER ON total hours, MICON VERSION and DIGITAL TV MICON FIRMWARE on the screen. Refer to the "WHEN REPLACING EEPROM(MEMORY) IC".
ALL mode	VOL. (-) MIN	9	2 sec.	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).
DVD mode (No disc)	REC/OTR	0	2 sec.	DVD Write mode. Refer to the "RE-WRITE FOR DVD FIRMWARE". NOTE: Do not use this for normal servicing.
DVD mode (No disc)	STOP(DVD)	1	3 sec.	Check for the firmware version. Refer to the "RE-WRITE FOR DVD FIRMWARE". NOTE: Do not use this for normal servicing.
DVD mode (No disc)	REC/OTR	4	2 sec.	Initialization of factory on DVD data. NOTE: Do not use this for normal servicing.
DVD mode (No disc)	STOP(DVD)	7	2 sec.	Releasing of PARENTAL LOCK. Refer to the "PARENTAL CONTROL - RATING LEVEL".

Set Condition	Set Key	Set Key	Standard Time	Operations
ALL mode	VOL. (-) MIN	FF	2 sec.	The BOT, EOT and the Reel Sensor do not work and the VCR deck can be operated without a cassette tape. Refer to the "PREPARATION FOR SERVING".

Method	Operations
Press the following remocon keys continuously. SETUP → SUBTITLE → 3 → AUDIO SELECT → 0	The disk cannot be taken out. Refer to the "TRAY LOCK".

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage.

Parts replacing time does not mean the life span for individual parts.

Also, long term storage or misuse may cause transformation and aging of rubber parts.

The following list means standard hours, so the checking hours depends on the conditions.

Time Parts Name	500 hours	1,000 hours	1,500 hours	2,000 hours	2,500 hours	Notes
Audio Control Head	■	■	■	●	●	Clean those parts in contact with the tape.
Full Erase Head (Recorder only)	■	■	■	●	●	
Capstan Belt		●	●	●	●	Clean the rubber, and parts which the rubber touches.
Pinch Roller	■	●	●	●	●	
Capstan DD Unit		●	●	●	●	
Loading Motor					●	
Tension Band		●	●	●	●	
T Brake Band		●	●	●	●	
Clutch Ass'y		●	●	●	●	
Idler Arm Ass'y		●	●	●	●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	Replace when rolling becomes abnormal.
Cylinder Unit	■	●	●	●	●	Clean the Head

■ : Clean

● : Check it and if necessary, replace it.

CONFIRMATION OF HOURS USED

POWER ON total hours and PLAY/REC total hours can be checked on the screen.

Total hours are displayed in 16 system of notation.

NOTE: If you set factory initialization, the total hours is reset to "0".

Initial Data setting will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On or alternatively, discharge backup capacitor.

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and the Channel button (6) on the remote control for more than 2 seconds.
3. After the confirmation of using hours, turn off the power.

NOTE: The each item value might be different according to each set.

```
INIT 00 57
CRT ON : 0000
PLAY/REC 0000
OEC7150A_15
DTV : CTT71152
INIT: 4B3C
ROM: 0844
```

(16 x 16 x 16 x thousands digit value) + (16 x 16 x hundreds digit value) + (16 x tens digit value) + (ones digit value)

PREVENTIVE CHECKS AND SERVICE INTERVALS

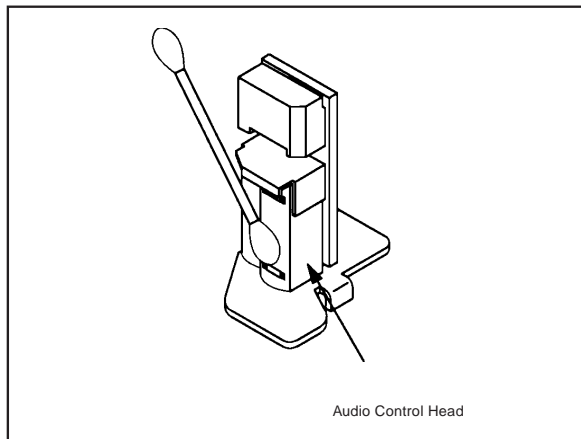
CLEANING

NOTE

After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

1. AUDIO CONTROL HEAD

Clean the Audio Control Head with a cotton stick soaked by alcohol. Clean the full erase head in the same manner. **(Refer to the figure below.)**



2. TAPE RUNNING SYSTEM

When cleaning the tape transport system, use gauze moistened with isopropyl alcohol.

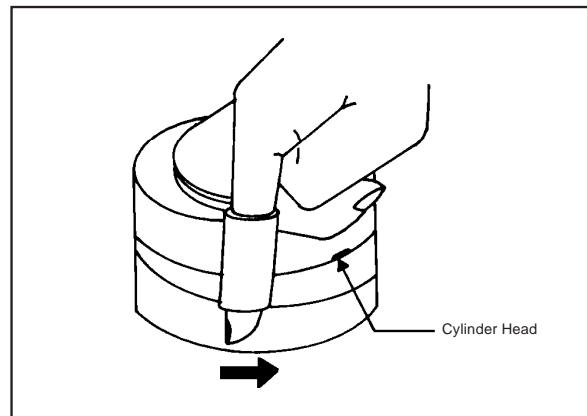
3. CYLINDER

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly.

Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). **(Refer to the figure below.)**

NOTE

Do not exert force against the cylinder head. Do not move the chamois upward or downward on the head. Use the chamois one by one.



RE-WRITE FOR DVD FIRMWARE

1. Turn on the power, and set the DVD mode.
2. Press both VOL. DOWN button on the set and Channel button **(0)** on the remote control for more than 2 seconds.
3. Press VOL. UP/DOWN button on the unit to check if all the keys on the unit do not function.

NOTE: To check if DVD Write mode is set.

When inserting Up-Date Disc (JG176) at Non DVD Write mode, the read error will happen.

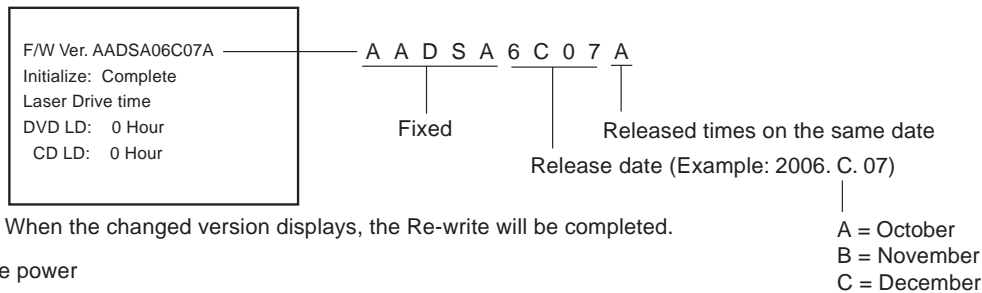
4. Insert the Up-Date Disc. (Refer to **SERVICING FIXTURE AND TOOLS**)
5. Automatic read will start and "Erase and Program Do Not Power Off" will be displayed on the screen.
At this time, the horizontal noise lines may appear. But no problem.
NOTE: Do not turn off the unit on the way or operate the keys on the unit and remocon.
Up-Date error will happen and can not be done with the Up-Date of Up-Date Disc (JG176).
6. After the Up-Date, Logo screen will appear.
7. Unplug the AC cord, then plug it in.

After the write, set to the initializing of shipping.

8. Turn on the power, and set the DVD mode.
9. Press both VOL. DOWN button on the set and Channel button **(4)** on the remote control for more than 2 seconds.
The "INITIALIZE 5 ----> COMPLETE" will appear on the screen.
10. Then unplug the AC cord, and plug it in.

CHECK FOR THE FIRMWARE VERSION

11. Turn on the power, and set the DVD mode.
12. Press both Channel button **(1)** on the remote control and the STOP button on the set for more than 3 seconds.
Firmware version will be displayed on the top left of the screen.



13. Turn off the power

RE-WRITE FOR DIGITAL SOFT FIRMWARE

1. Confirm that the AC cord is plugged out.
2. Using the Serial Communication Change JIG (**JG205**), connect the set to personal computer. (**Refer to Fig. 1**)

NOTE: It is possible to write only with the personal computer of WINDOWS.

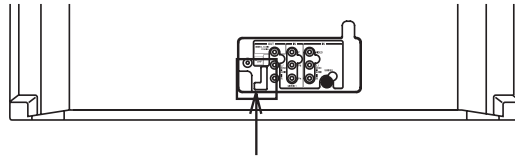


Fig. 1

3. Using the Flash UP-Date Soft Disc (**JG206**) and USA SD DTV ROM DISC(**JG176**), please Re-write the DIGITAL SOFT FIRMWARE.
The operating manual for Re-writing is included in Flash UP-Date Soft Disc (**JG206**).

WHEN REPLACING EEPROM (MEMORY) IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

INIT	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	57	00	00	20	09	B3	24	0F	D1	80	18	A0	FA	0E	2B	19
10	B1	9A	97	8C	7D	00	10	A1	88	82	A4	55	64	45	06	8C
20	80	39	01	22	75	65	2A	3B	95	01	C6	06	B1	0F	00	08
30	88	00	00	00	00	09	70	03	03	01	00	04	46	03	C8	33
40	33	33	03	A0	88	11	2D	30	00	50	50	00	00	20	88	88
50	15	64	23	01	0C	35	59	00	32	45	A0	00	FF	00	00	00
60	00	A6	00	00	00	00	00	00	00	00	00	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
80	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
90	00	00	00	00	00	00	00	00	00	00	00	04	A0	02	00	8C
A0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	83
B0	02	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
C0	72	76	7A	82	86	8A	8E	92	96	9A	9E	A2	A6	AA	AE	B2
D0	B5	B8	BB	BE	C0	C2	C4	C6	C6	C7	C7	C8	C9	CA	CB	CC
E0	CD	CE	CF	D0	D1	D1	D2	D2	D3	D4	D5	D6	D6	D7	D8	D9
F0	DA	DB	DC	DD	DE	DF	E0	E0	E1	E1	E2	E2	E2	E3	E3	E3

Table 1

1. Turn on the POWER, and set to the TV mode.
2. Set the VOLUME to minimum.
3. Press both VOL. DOWN button on the set and the Channel button (6) on the remote control for more than 2 seconds. ADDRESS and DATA should appear as FIG 1.

NOTE: The each item value might be different according to each set.

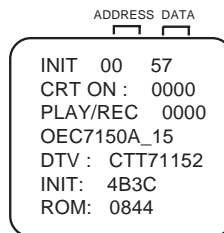


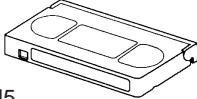
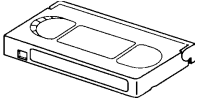
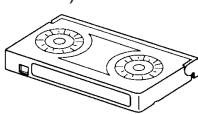
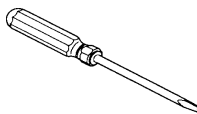
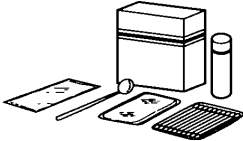


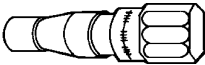
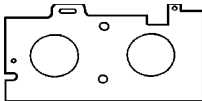
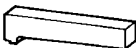
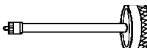



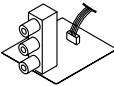
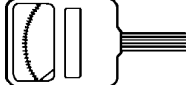
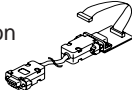

Fig. 1

4. ADDRESS is now selected and should "blink". Using the UP/DOWN button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
5. Press ENTER to select DATA. When DATA is selected, it will "blink".
6. Again, step through the DATA using UP/DOWN button until required DATA value has been selected.
7. Pressing RIGHT/LEFT button will take you back to ADDRESS for further selection if necessary.
8. Repeat steps 4 to 6 until all data has been checked.
9. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.

After the data input, set to the initializing of shipping.

10. Turn on the POWER.
 11. Set the VOLUME to minimum.
 12. Press both VOL. DOWN button on the set and the Channel button (1) on the remote control for more than 2 seconds.
 13. After the finishing of the initializing of shipping, the unit will turn off automatically.
- The unit will now have the correct DATA for the new MEMORY IC.

SERVICING FIXTURES AND TOOLS

<p>Alignment Tape</p>  <p>ST-N5 ST-NF</p>	<p>Back tension cassette gauge</p>  <p>70909103</p>	<p>Torque cassette gauge (KT-300NR)</p>  <p>70909199</p>	<p>Taper nut driver</p>  <p>70909228</p>
<p>VTR cleaning kit</p> 	<p>VTR lubrication kit</p> 	<p>Grease</p> 	<p>JG002B Adapter JG002E Dial Torque Gauge (10~90gf•cm) JG002F (60~600gf•cm)</p> 
<p>JG022 Master Plane</p> 	<p>JG024A Reel Disk Height Adjustment Jig</p> 	<p>JG153 X Value Adjustment Screwdriver</p> 	<p>JG154 Cable</p> 
<p>JG176 Up-Date Disc</p> 	<p>JG176 2007 SD DTV Rom Disc</p> 	<p>JG180 AV Jack Jig</p> 	<p>JG185 Tentelometer</p> 
<p>JG205 Serial Communication Change JIG</p> 	<p>JG206 Flash UP-Date Soft Disc</p> 		

Ref. No.	Part No.	Parts Name	Remarks
JG002B	APJG002B00	Adapter	VSR Torque, Brake Torque (S Reel/T Reel Ass'y)
JG002E	APJG002E00	Dial Torque Gauge (10~90gf•cm)	Brake Torque (T Reel Ass'y)
JG002F	APJG002F00	Dial Torque Gauge (60~600gf•cm)	VSR Torque, Brake Torque (S Reel)
JG022	APJG022000	Master Plane	Reel Disk Height Adjustment
JG024A	APJG024A00	Reel Disk Height Adjustment Jig	Reel Disk Height Adjustment
JG153	APJG153000	X Value Adjustment Screwdriver	X Value Adjustment
JG154	APJG154000	Cable	Used to connect the test point of SERVICE and GROUND
JG176	APJG176122	Up-Date Disc	Up-Date of the DVD Firmware
JG176	APJG176125	2007 SD DTV Rom Disc	Up-Date of the DIGITAL Firmware
JG180	APJG180A000	AV Jack Jig	PG Shifter Adjustment
JG185	APJG185000	Tentelometer	Confirmation of Tape Tension on Playback
JG205	APJG205000	Serial Communication Change JIG	Connect the set to personal computer
JG206	APJG206000	Flash UP-Date Soft Disc	Up-Date of the Firmware

PREPARATION FOR SERVICING

How to use the Servicing Fixture

1. While pressing the CH DOWN button on the set for more than 2 seconds, press the ON/STANDBY button on the set simultaneously at the Power OFF. Although the DVD is connected, the DVD mode cannot be selected.
2. Short circuit between **TP1001** and **Ground** with the cable JG154.
(The BOT, EOT, and the Reel Sensor do not work and the VCR deck can be operated without a cassette tape.)
3. In case of using a cassette tape, press the EJECT button to insert or eject a cassette tape.
Turn on the power and re-check the cable before checking the trouble points.

When you servicing with connection of DVD, perform the operations above step 2 to step 3.

MECHANICAL ADJUSTMENTS

1. CONFIRMATION AND ADJUSTMENT

Read the following NOTES before starting work.

- Place an object which weighs between 450g~500g on the Cassette Tape to keep it steady when you want to make the tape run without the Cassette Holder. (Do not place an object which weighs over 500g.)

1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

- Turn on the power and set to the STOP mode.
- Set the master plane (**JG022**) and reel disk height adjustment jig (**JG024A**) on the mechanism framework, taking care not to scratch the drum, as shown in **Fig. 1-1-A**.
- While turning the reel and confirm the following points. Check if the surface "A" of reel disk is lower than the surface "B" of reel disk height adjustment jig (**JG024A**) and is higher than the surface "C". If it is not passed, place the height adjustment washers and adjust to 10(+2, -0)mm.
- Adjust the other reel in the same way.

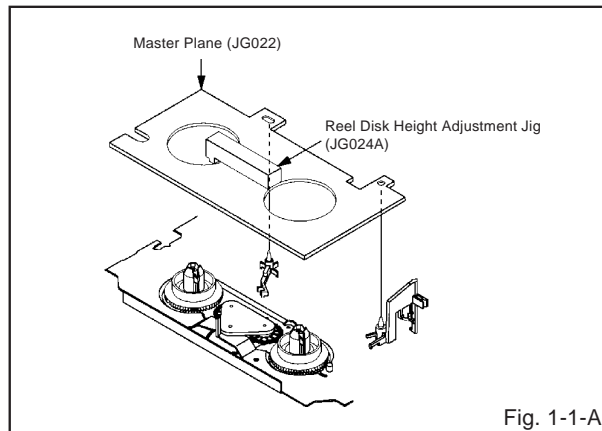


Fig. 1-1-A

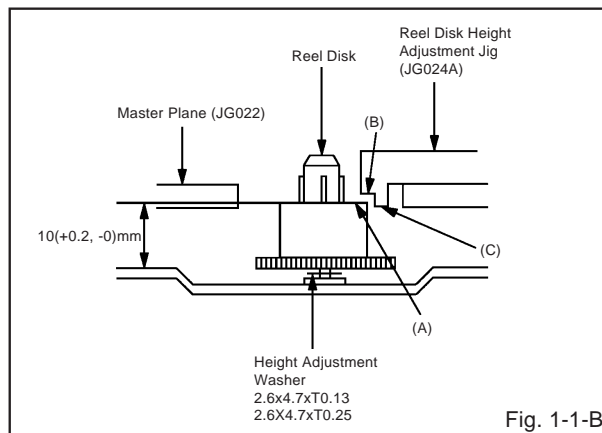


Fig. 1-1-B

1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

- Set to the PLAY mode.
- Adjust the adjusting section for the Tension Arm position so that the Tension Arm top is within the standard line of Main Chassis.
- While turning the S Reel clockwise, confirm that the edge of the Tension Arm is located in the position described above.

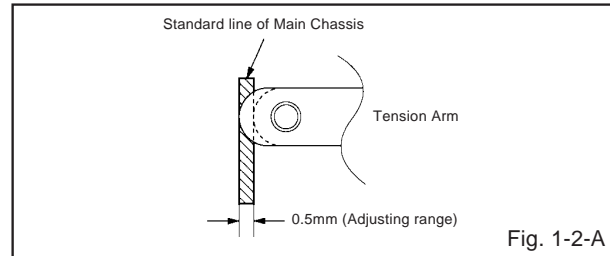


Fig. 1-2-A

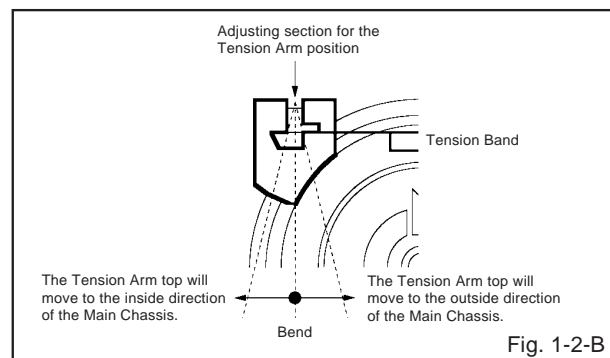


Fig. 1-2-B

1-3: CONFIRMATION OF PLAYBACK TORQUE AND BACK TENSION TORQUE DURING PLAYBACK

- Load a video tape (T-120) recorded in standard speed mode. Set the unit to the PLAY mode.
- Install the tentelometer (JG185) as shown in **Fig. 1-3**. Confirm that the meter indicates $20 \pm 2\text{gf}$ in the beginning of playback.

• USING A CASSETTE TYPE TORQUE TAPE (KT-300NR)

- After confirmation and adjustment of Tension Post position (Refer to item 1-2), load the cassette type torque tape (**KT-300NR**) and set to the PLAY mode.
- Confirm that the right meter of the torque tape indicates 50~90gf•cm during playback in SP mode.
- Confirm that the left meter of the torque tape indicates 25~40gf•cm during playback in SP mode.

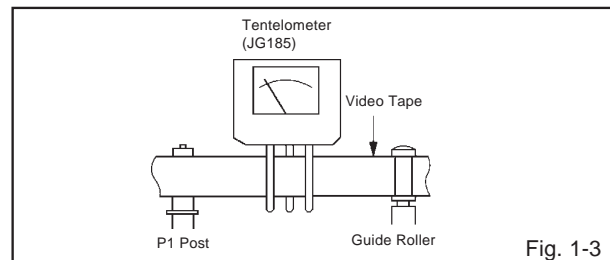


Fig. 1-3

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF VSR TORQUE

1. Install the Torque Gauge (**JG002F**) and Adapter (**JG002B**) on the S Reel. Set to the Picture Search (Rewind) mode. (Refer to Fig.1-4-B)
2. Then, confirm that it indicates 120~180gf•cm.

NOTE

Install the Torque Gauge on the reel disk firmly. Press the REW button to turn the reel disk.

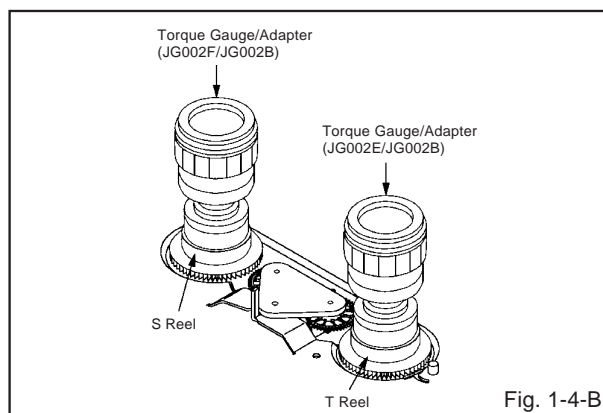
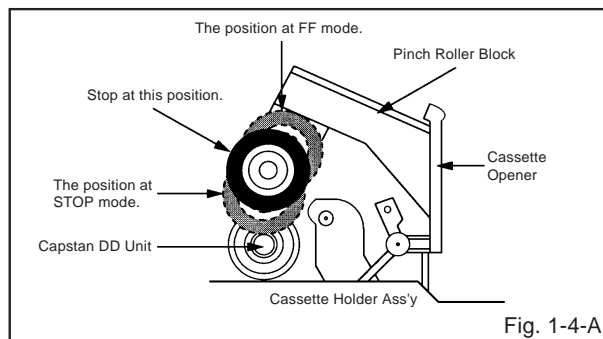
1-5: CONFIRMATION OF REEL BRAKE TORQUE

(S Reel Brake) (Refer to Fig. 1-4-B)

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of Fig. 1-4-A.
2. Move the Idler Ass'y from the S Reel.
3. Install the Torque Gauge (**JG002F**) and Adapter (**JG002B**) on the S Reel. Turn the Torque Gauge (**JG002F**) clockwise.
4. Then, confirm that it indicates 60~100gf•cm.

(T Reel Brake) (Refer to Fig. 1-4-B)

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of Fig. 1-4-A.
2. Move the Idler Ass'y from the T Reel.
3. Install the Torque Gauge (**JG002E**) and Adapter (**JG002B**) on the T reel. Turn the Torque Gauge (**JG002E**) counterclockwise.
4. Then, confirm that it indicates 30~50gf•cm.



NOTE

If the torque is out of the range, replace the following parts.

Check item	Replacement Part
1-4	Idler Ass'y/Clutch Ass'y
1-5	S Reel side: S Reel/Tension Band/Tension Connect/Tension Arm Ass'y T Reel side: T Reel/T Brake Band//T Brake Spring/T Brake Arm

2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

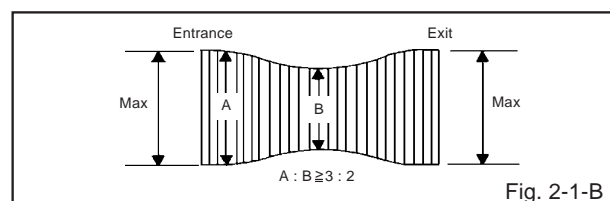
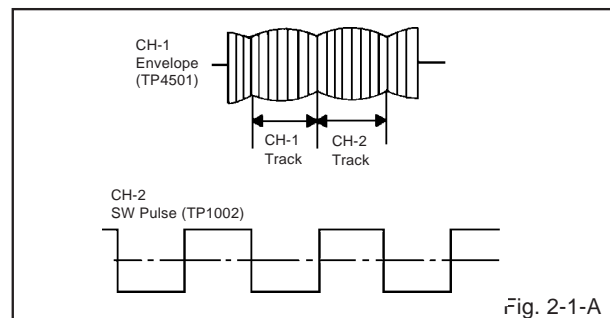
2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape (Monoscope of ST-N5 MODE2).
2. Connect CH-1 of the oscilloscope to **TP4501 (Envelope)** and CH-2 to **TP1002 (SW Pulse)**.
3. Trigger with SW Pulse and observe the envelope. (Refer to Fig. 2-1-A)
4. When observing the envelope, adjust the Taper Nut Driver slightly until the envelope will be flat. Even if you press the Tracking Button, adjust so that flatness is not moved so much.
5. Adjust so that the A : B ratio is better than 3 : 2 as shown in Fig. 2-1-B, even if you press the Tracking Button to move the envelope (The envelope waveform will begin to decrease when you press the Tracking Button).
6. Adjust the PG shifter during playback.

(Refer to the ELECTRICAL ADJUSTMENTS)

NOTE

After adjustment, confirm and adjust A/C head. (Refer to item 2-2)



MECHANICAL ADJUSTMENTS

2-2: CONFIRMATION AND ADJUSTMENT OF AUDIO/CONTROL HEAD

When the Tape Running Mechanism does not work well, adjust the following items.

1. Playback the VHS Alignment Tape (Monoscope of ST-N5 MODE2).
2. Confirm that the reflected picture of stamp mark is appeared on the tape prior to P4 Cap as shown in **Fig. 2-2-A**.
 - a) When the reflected picture is distorted, turn the screw (1) clockwise until the distortion is disappeared.
 - b) When the reflected picture is not distorted, turn the screw (1) counterclockwise until little distortion is appeared, then adjust the a).
3. Turn the screw (2) to set the audio level to maximum.
4. Confirm that the bottom of the Audio/Control Head and the bottom of the tape is shown in **Fig. 2-2-C**.
 - c) When the height is not correct, turn the screw (3) to adjust the height. Then, adjust the 1~3 again.

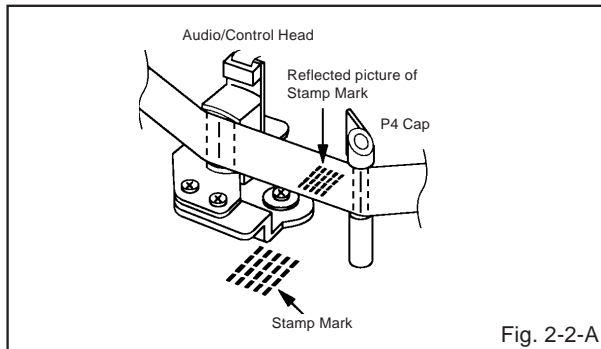


Fig. 2-2-A

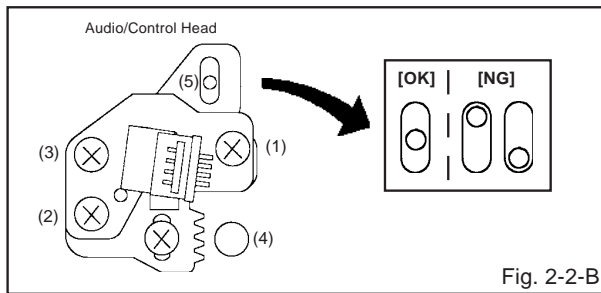


Fig. 2-2-B

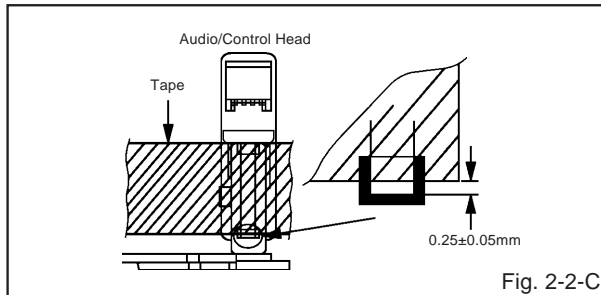


Fig. 2-2-C

2-3: TAPE RUNNING ADJUSTMENT (X VALUE ADJUSTMENT)

1. Confirm and adjust the height of the Reel Disk. (**Refer to item 1-1**)
2. Confirm and adjust the position of the Tension Post. (**Refer to item 1-2**)
3. Adjust the Guide Roller. (**Refer to item 2-1**)
4. Confirm and adjust the Audio/Control Head. (**Refer to item 2-2**)
5. Connect CH-1 of the oscilloscope to **TP1002**, CH-2 to **TP4501** and CH-3 to **HOT side of Audio Out Jack**.
6. Playback the VHS Alignment Tape.
7. Press and hold the Digital Tracking button on the remote control more than 2 seconds to set tracking to center.
8. Set the X Value adjustment driver (**JG153**) to the 4 of **Fig. 2-2-B**. Adjust X value so that the envelope waveform output becomes maximum. Check if the relation between Audio and Envelope waveform becomes (1) or (2) of **Fig. 2-3**.

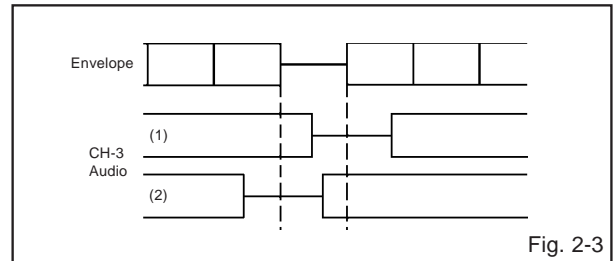
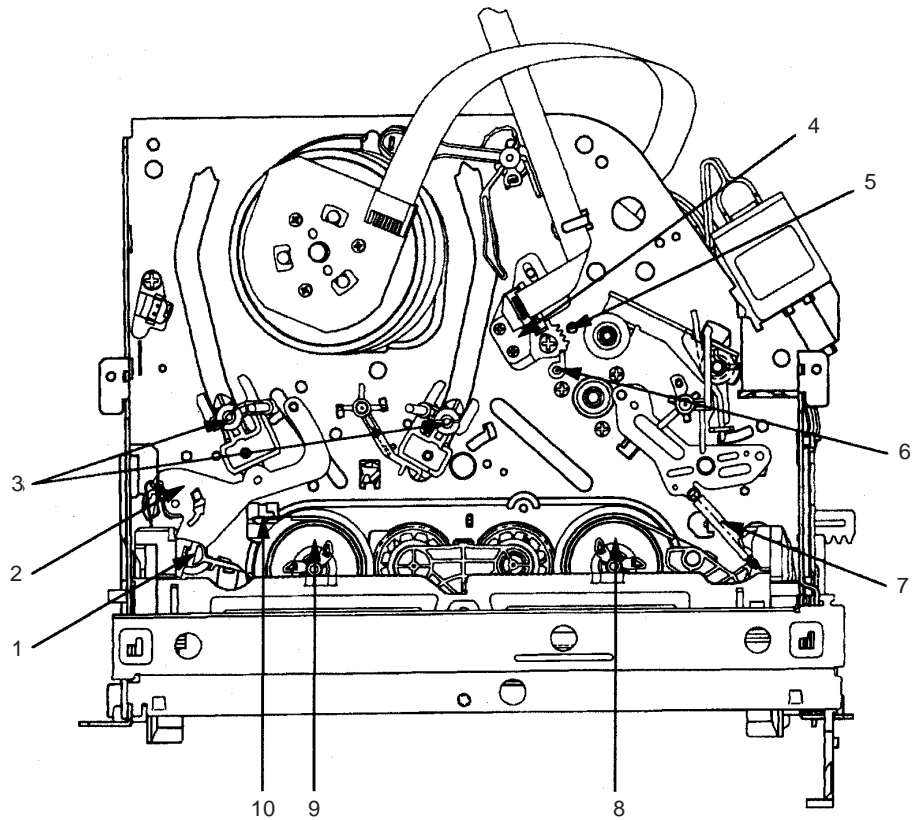


Fig. 2-3

MECHANICAL ADJUSTMENTS

3. MECHANISM ADJUSTMENT PARTS LOCATION GUIDE



- | | |
|-----------------------------------|--|
| 1. Tension Connect | 6. P4 Post |
| 2. Tension Arm | 7. T Brake Spring |
| 3. Guide Roller | 8. T Reel |
| 4. Audio/Control Head | 9. S Reel |
| 5. X value adjustment driver hole | 10. Adjusting section for the Tension Arm position |

ELECTRICAL ADJUSTMENTS

1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
- When you exchange IC and Transistor with a heat sink, apply silicon grease on the contact section of the heat sink. Before applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor).

Prepare the following measurement tools for electrical adjustments.

1. Oscilloscope
2. Digital Voltmeter
3. Multi-sound Generator
4. Pattern Generator

On-Screen Display Adjustment

1. Unplug the AC plug for more than 5 seconds to set the clock to the non-setting state. Then, set the volume level to minimum.
2. Press the VOL. DOWN button on the set and the Channel button (9) on the remote control for more than 2 seconds to appear the adjustment mode on the screen as shown in Fig. 1-1.

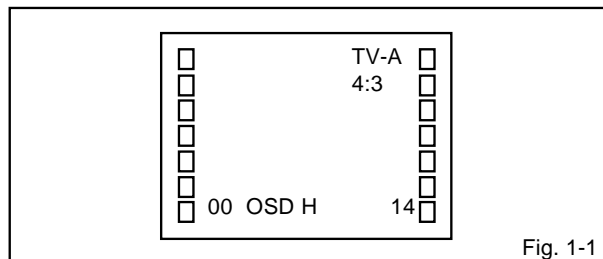


Fig. 1-1

3. Use the Channel UP/DOWN button or Channel button (0-9) on the remote control to select the options shown in Fig. 1-2.
4. Press the MENU button on the remote control to end the adjustments.
5. To display the adjustment screen for TV-A, TV-D, AV and YUV mode, press the INPUT button on the remote control.
To display the adjustment screen for DVD mode, Press the VOL.DOWN button on the set and the Channel (9) on the remote control for more than 2 seconds.

NO.	FUNCTION	NO.	FUNCTION
00	OSD H	31	BRI MIN
01	OSD C	32	CONT CENT
02	CUT OFF	33	CONT MAX
03	H.POSI	34	CONT MIN
04	H.BLK L	35	COL CENT
05	H.BLK R	36	COL MAX
06	V.SIZE	37	COL MIN
07	V.POSI	38	TINT
08	V.LIN	39	SHAR CENT
09	VS.CORR	40	SHAR MAX
10	V.COMP	41	SHAR MIN
11	R.BIAS	42	SUB BIAS
12	G.BIAS	43	H.SIZE
13	B.BIAS	44	PARABOLA
14	R.DRV	45	TRAPEZIUM
15	G.DRV	46	COR TOP
16	B.DRV	47	COR BTM
29	BRI CENT	48	T.STE
30	BRI MAX	49	X-RAY

Fig. 1-2

2. BASIC ADJUSTMENTS (VCR SECTION)

2-1: PG SHIFTER

1. Connect the connector of AV Jack Jig (JG180) to CP603.
2. Connect CH-1 on the oscilloscope to TP1002 and CH-2 to HOT side of JG180 Video Out Jack.
3. Playback the alignment tape.
4. Press both VOL. DOWN button on the set and the Channel button (5) on the remote control for more than 2 seconds to set tracking to center.
5. Press the VOL. DOWN button on the set and the channel button (3) on the remote control for more than 2 seconds until the indicator REC disappears. If the indicator REC disappears, adjustment is completed.

(If the above adjustments doesn't work well:)

6. Press the VOL. DOWN button on the set and the channel button (3) on the remote control for more than 2 seconds until the indicator REC disappears.
7. When the REC indicator is blinking, press both VOL. DOWN button on the set and the channel button (4) on the remote control for more than 2 seconds and adjust the Tracking +/- button until the arising to the down of Head Switching Pulse becomes $6.5 \pm 0.5H$.
(Refer to Fig. 2-1-A, B)

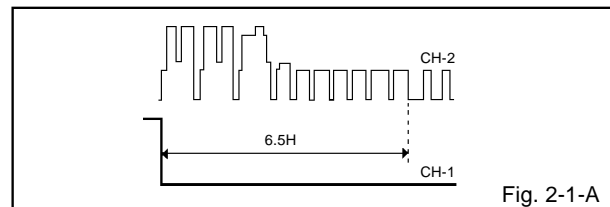


Fig. 2-1-A

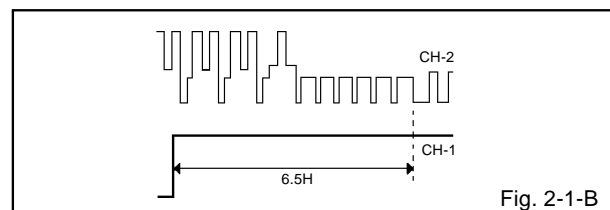


Fig. 2-1-B

ELECTRICAL ADJUSTMENTS

(TV SECTION)

2-2: CONSTANT VOLTAGE

1. Place the set in AV MODE without signal.
2. Using the remote control, set the brightness and contrast to normal position.
3. Connect the digital voltmeter to **TP401**.
4. Adjust the **VR1701** until the digital voltmeter is $115 \pm 0.5V$.

2-3: CUT OFF

1. Adjust the unit to the following settings.
R.BIAS=127, G.BIAS=127, B.BIAS=127, R.DRV=63,
G.DRV=07, B.DRV=63, BRI CENT=00,
CONT MAX=32.
2. Place the set in Aging Test for more than 20 minutes.
3. Place the set in AV MODE without signal.
4. Using the remote control, set the brightness and contrast to normal position.
5. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(02)** on the remote control to select "CUT OFF".
6. Adjust the **Screen Volume** until a dim raster is obtained.

2-4: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set in Aging Test for more than 20 minutes.
2. Receive the gray scale pattern from the Pattern Generator.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(11)** on the remote control to select "R.BIAS".
5. Press the UP/DOWN button on the remote control to select the "R.BIAS", "G.BIAS", "B.BIAS", "R.DRV", "B.DRV" or "G.DRV".
6. Adjust the LEFT/RIGHT button on the remote control to whiten the R.BIAS, G.BIAS, B.BIAS, R.DRV, B.DRV, and G.DRV at each step tone sections equally.
7. Perform the above adjustments 5 and 6 until the white color is achieved.

2-5: FOCUS

1. Receive the monoscope pattern.
2. Turn the Focus Volume fully counterclockwise once.
3. Adjust the **Focus Volume** until picture is distinct.

2-6: OSD HORIZONTAL

1. Activate the adjustment mode display of **Fig. 1-1**.
2. Press the LEFT/RIGHT button on the remote control until the difference of A and B becomes minimum.
(Refer to Fig. 2-2).

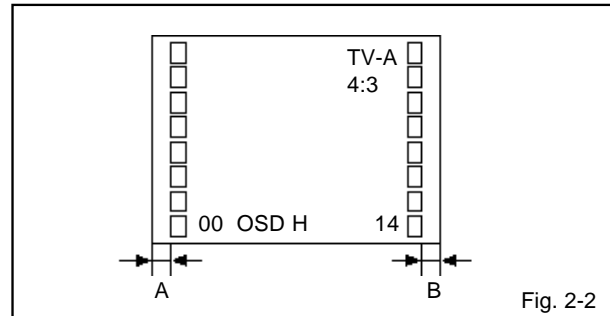


Fig. 2-2

2-7: HORIZONTAL POSITION

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(03)** on the remote control to select "H.POSI".
4. Press the LEFT/RIGHT button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

2-8: VERTICAL POSITION

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(07)** on the remote control to select "V.POSI".
4. Check if the step No. V.POSI is "01".
5. Adjust the **VR404** until the horizontal line becomes fit to the notch of the shadow mask.**(Refer to Fig. 2-3).**

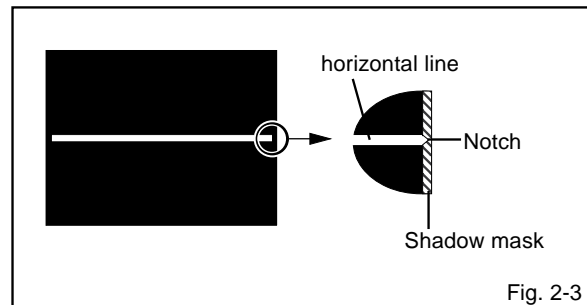


Fig. 2-3

2-9: VERTICAL SIZE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(06)** on the remote control to select "V.SIZE".
4. Press the LEFT/RIGHT button on the remote control until SHIFT quantity of the OVER SCAN on upside and downside becomes $10 \pm 2\%$.
5. Receive a broadcast and check if the picture is normal.

ELECTRICAL ADJUSTMENTS

2-10: VERTICAL LINEARITY

NOTE: Adjust after performing adjustments in section 2-9.
After the adjustment of Vertical Linearity, reconfirm the Vertical Position and Vertical Size adjustments.

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(08)** on the remote control to select "V.LIN".
4. Press the LEFT/RIGHT button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.

2-11: COLOR CENTER

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the oscilloscope to **TP022**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(35)** on the remote control to select "COL CENT".
5. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is the set to 4 scales on the screen of the oscilloscope.
6. Press the LEFT/RIGHT button on the remote control until the red color level is adjusted to $110 \pm 5\%$ of the white level. **(Refer to Fig. 2-4)**
7. Receive the digital broadcast. (RF Input)
8. Perform the above adjustments 2~6.
9. Receive the color bar pattern. (VIDEO Input)
10. Press the INPUT button on the remote control to set to the AV mode. Then perform the above adjustments 2~6.
11. Playback the DVD(480i) disc. (COMPONENT Input)
12. Press the INPUT button on the remote control to set to the YUV mode. Then perform the above adjustments 2~6.
13. Playback the DVD(480i) disc.
14. Press the DVD button on the remote control to set to the DVD mode.
15. Activate the adjustment mode display of **Fig. 1-1** and
16. press the channel button **(35)** on the remote control to select "COL CENT".
17. Press the LEFT/RIGHT button on the remote control to set the same step numbers as the AV mode.

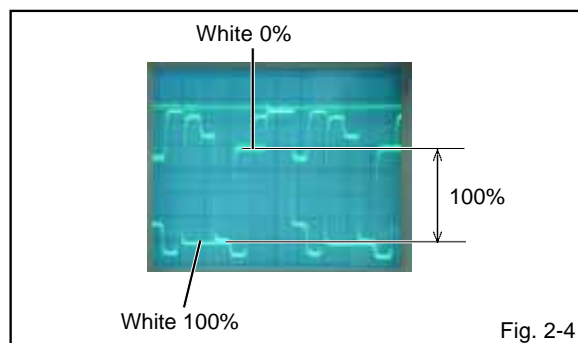


Fig. 2-4

2-12: TINT

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the oscilloscope to **TP024**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(38)** on the remote control to select "TINT".
5. Press the LEFT/RIGHT button on the remote control until the section "A" becomes a straight line. **(Refer to Fig. 2-5).**
6. Receive the digital broadcast. (RF Input)
7. Perform the above adjustments 2~5.
8. Receive the color bar pattern. (VIDEO Input)
9. Press the INPUT button on the remote control to set to the AV mode. Then perform the above adjustments 2~5.
10. Playback the DVD(480i) disc. (COMPONENT Input)
11. Press the INPUT button on the remote control to set to the YUV mode. Then perform the above adjustments 2~5.
12. Playback the DVD(480i) disc.
13. Press the DVD button on the remote control to set to the DVD mode.
14. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(38)** on the remote control to select "TINT".
15. Press the LEFT/RIGHT button on the remote control to set the same step numbers as the AV mode.

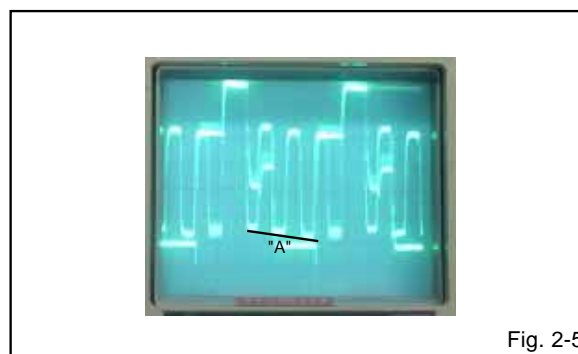


Fig. 2-5

ELECTRICAL ADJUSTMENTS

2-13: BRIGHT CENTER

1. Receive the monoscope pattern. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(29)** on the remote control to select "BRI CENT".
4. Press the LEFT/RIGHT button on the remote control until the white 10% is starting to be visible
5. Receive the monoscope pattern. (VIDEO Input)
6. Press the INPUT button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.
7. Playback the DVD(480i) disc.(COMPONENT Input)
8. Press the INPUT button on the remote control to the YUV mode. Then perform the above adjustments 2~4.
9. Receive a broadcast and check if the picture is normal.
10. Receive the digital broadcast. (RF Input)
11. Press the INPUT button on the remote control to set to the DIGITAL mode.
12. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(29)** on the remote control to select "BRI CENT".
13. Press the LEFT/RIGHT button on the remote control to decrease the step numbers by 5 step to the AV mode.
14. Playback the DVD(480i) disc.
15. Press the DVD button on the remote control to set to the DVD mode.
16. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(29)** on the remote control to select "BRI CENT".
17. Press the LEFT/RIGHT button on the remote control to set the same step numbers as the AV mode.

2-14: CONTRAST MAX

1. Receive the monoscope pattern. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and
4. press the channel button **(33)** on the remote control to select "CONT MAX".
5. Press the LEFT/RIGHT button on the remote control until the contrast step numbers becomes "121".
6. Receive a broadcast and check if the picture is normal.
7. Receive the digital broadcast. (RF Input)
8. Perform the above adjustments 2~5.
9. Receive the monoscope pattern. (VIDEO Input)
10. Press the INPUT button on the remote control to set to the AV mode.
11. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(33)** on the remote control to select "CONT MAX".
12. Press the LEFT/RIGHT button on the remote control until the contrast step numbers become "121".
13. Receive a broadcast and check if the picture is normal.
14. Playback the DVD(480i) disc. (COMPONENT Input)
15. Press the INPUT button on the remote control to set to the YUV mode.
16. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(33)** on the remote control to select "CONT MAX".
17. Press the LEFT/RIGHT button on the remote control to until the contrast step numbers as the AV mode.
18. Playback the DVD(480i) disc.
19. Press the DVD button on the remote control to set to the DVD mode.
20. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(33)** on the remote control to select "CONT MAX".
21. Press the LEFT/RIGHT button on the remote control to decrease the step numbers by 10 step to the AV mode.

2-15: HORIZONTAL SIZE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to max position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(43)** on the remote control to select "H.SIZE".
4. Press the LEFT/RIGHT button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes 10±4%.

ELECTRICAL ADJUSTMENTS

2-16: PARABOLA

1. Receive the crosshatch signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(44)** on the remote control to select "PARABOLA".
4. Press the LEFT/RIGHT button on the remote control until the right and left vertical lines are straight.

2-17: TRAPEZIUM

1. Receive the crosshatch signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(45)** on the remote control to select "TRAPEZIUM".
4. Press the LEFT/RIGHT button on the remote control until the the upper section of the both ends vertical lines are straight.

2-18: CORNER CORR TOP

1. Receive the crosshatch signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(46)** on the remote control to select "COR TOP".
4. Press the LEFT/RIGHT button on the remote control until the the upper section of the both ends vertical lines are straight.

2-19: CORNER CORR BOTTOM

1. Receive the crosshatch signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(47)** on the remote control to select "COR BTM".
4. Press the LEFT/RIGHT button on the remote control until the the upper section of the both ends vertical lines are straight.

2-20: Confirmation of Fixed Value (step No.)

Please check if the fixed values of the each adjustment item is set correctly referring below.

		ANALOG DIGITAL VIDEO1, VIDEO2 Color Stream				
NO.	FUNCTION	TV-A	TV-D	AV	YUV	DVD
01	OSD C	02	02	02	02	02
04	H.BLK L	06	06	06	06	06
05	H.BLK R	03	03	03	03	03
09	VS.CORR	07	07	07	07	07
10	V.COMP	03	03	03	03	03
15	G DRV	07	07	07	07	07
30	BRI MAX	50	50	50	50	50
31	BRI MIN	10	10	10	10	10
32	CONT CENT	70	60	70	70	70
34	CONT MIN	15	15	15	15	15
36	COL MAX	127	127	127	127	127
37	COL MIN	00	00	00	00	00
39	SHAR CENT	30	30	30	30	25
40	SHAR MAX	63	63	63	63	63
41	SHAR MIN	05	05	05	05	05
42	SUB BIAS	00	00	00	00	00
43	T.STE	00	00	00	00	00

ELECTRICAL ADJUSTMENTS

3. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 3-1)**
If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

3-2: PURITY

NOTE

Adjust after performing adjustments in section 3-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.
Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue color.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

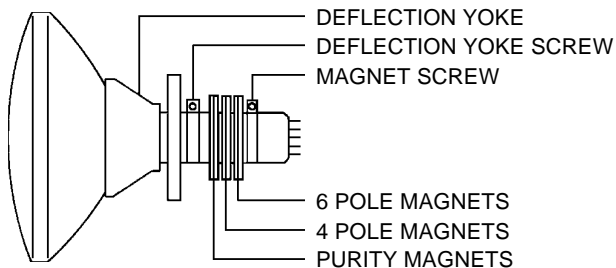


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

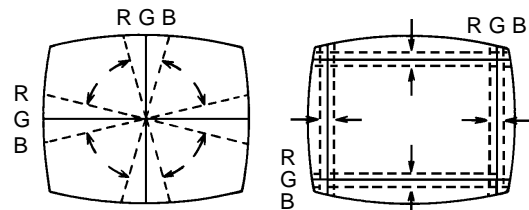
1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

3-4: DYNAMIC CONVERGENCE

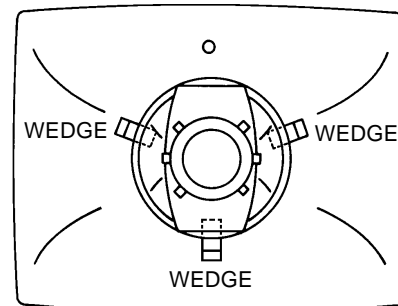
NOTE

Adjust after performing adjustments in section 3-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left.
(Refer to Fig. 3-2-a)
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke.
(Refer to Fig. 3-2-b)



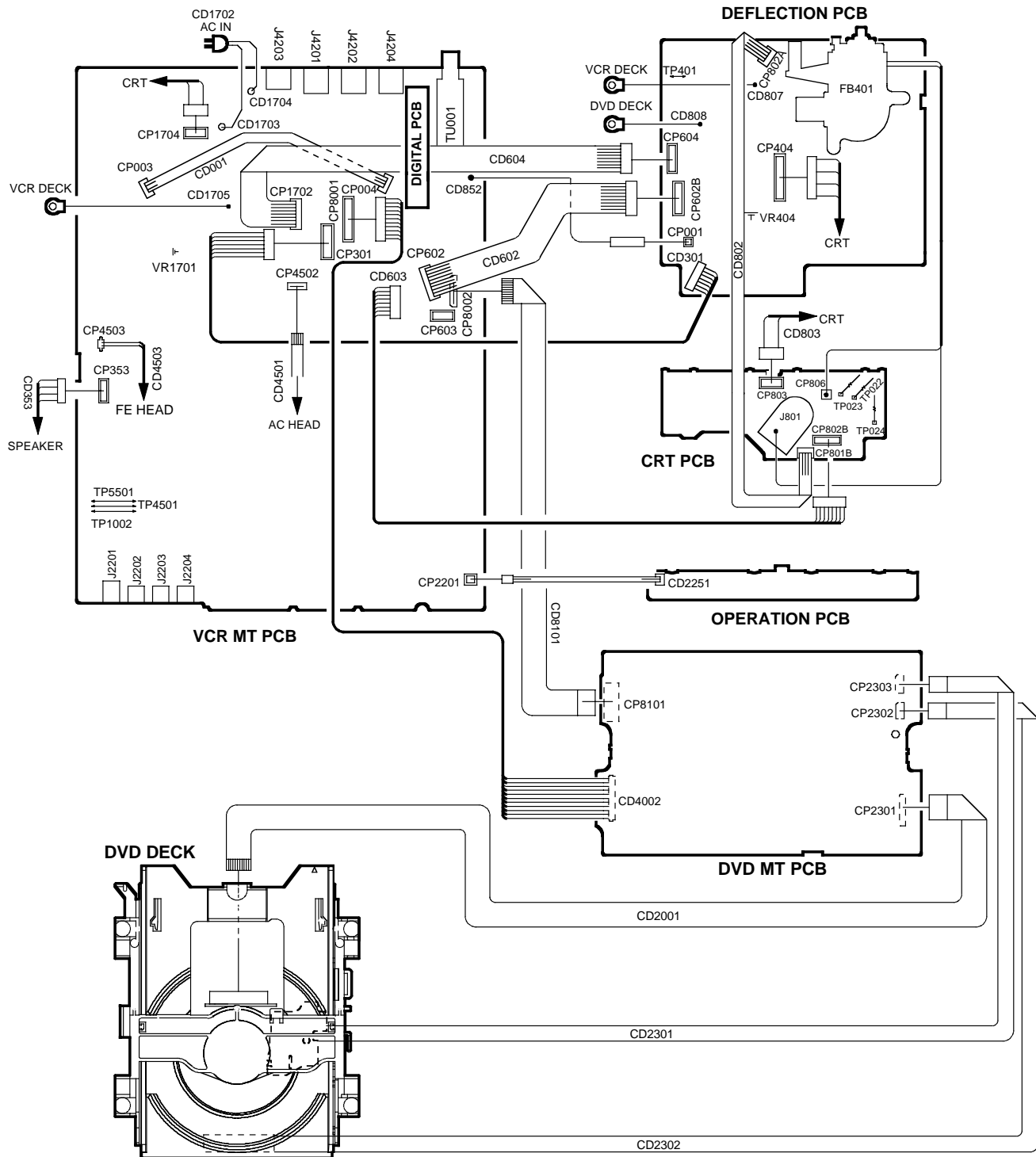
UPWARD/DOWNWARD SLANT RIGHT/LEFT SLANT
Fig. 3-2-a



WEDGE POSITION
Fig. 3-2-b

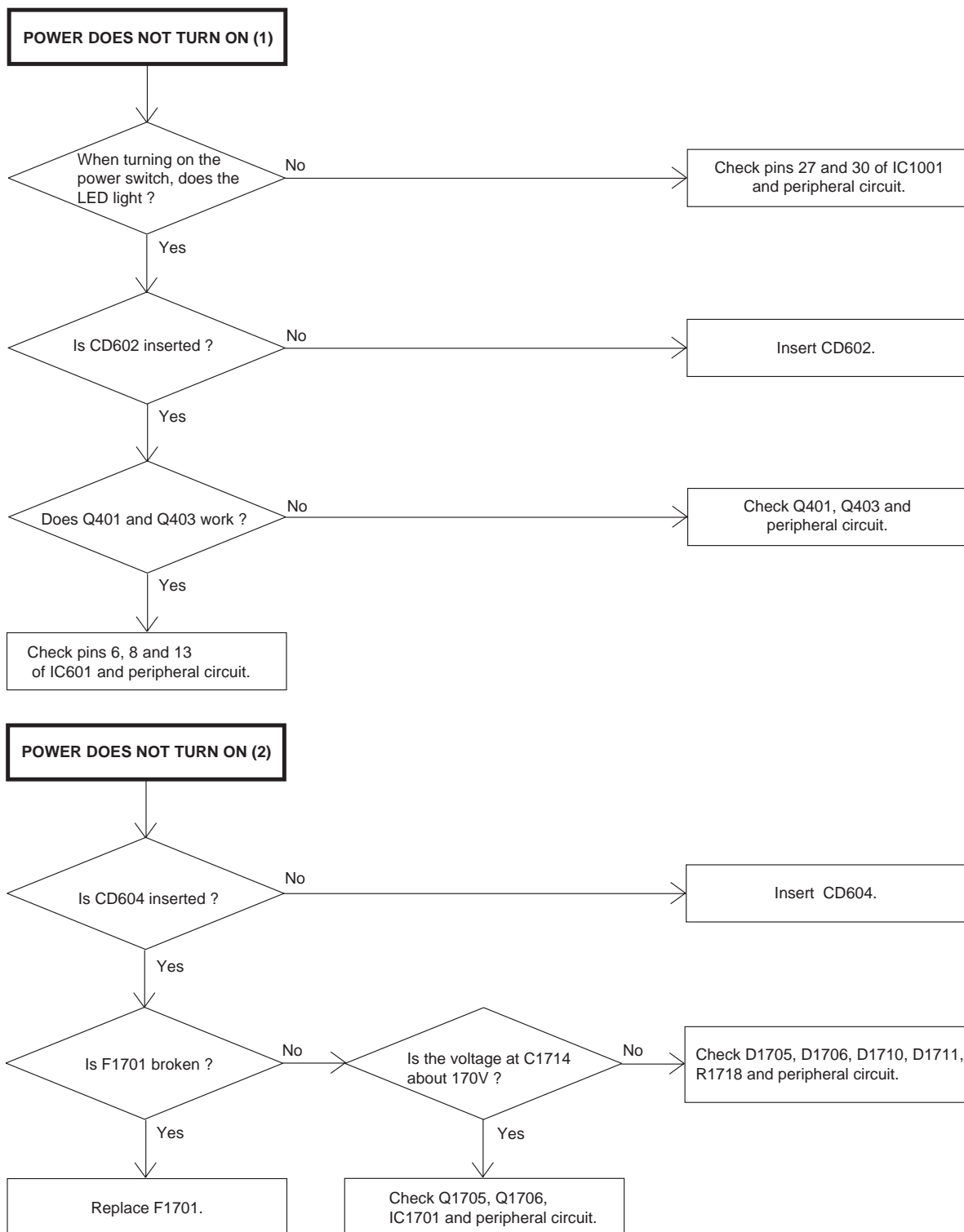
ELECTRICAL ADJUSTMENTS

4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)

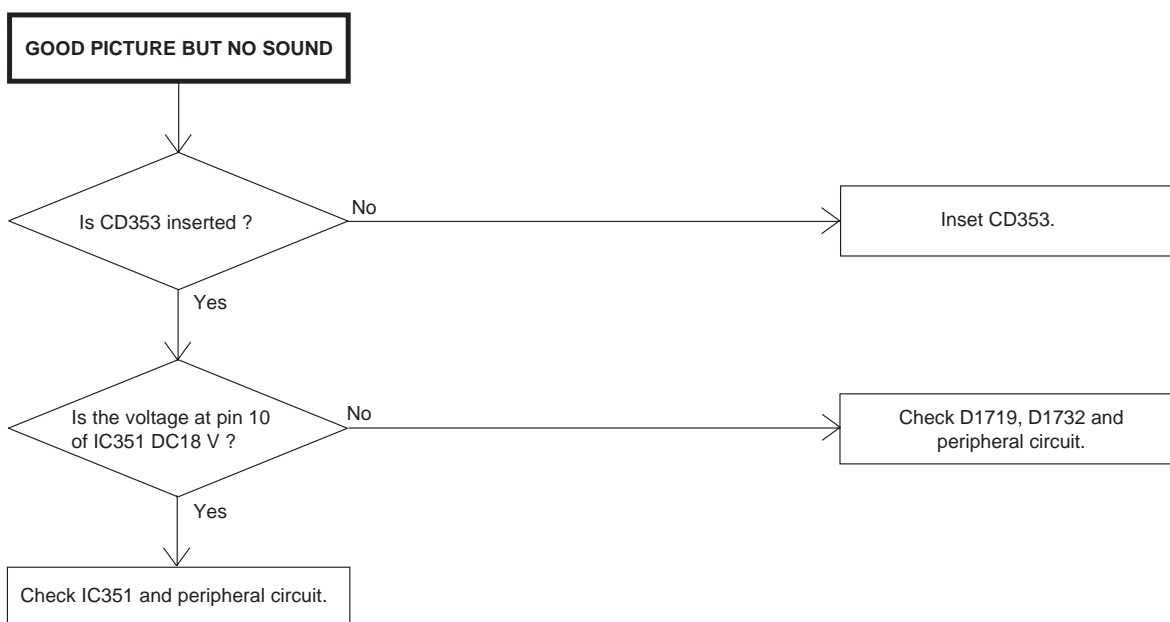
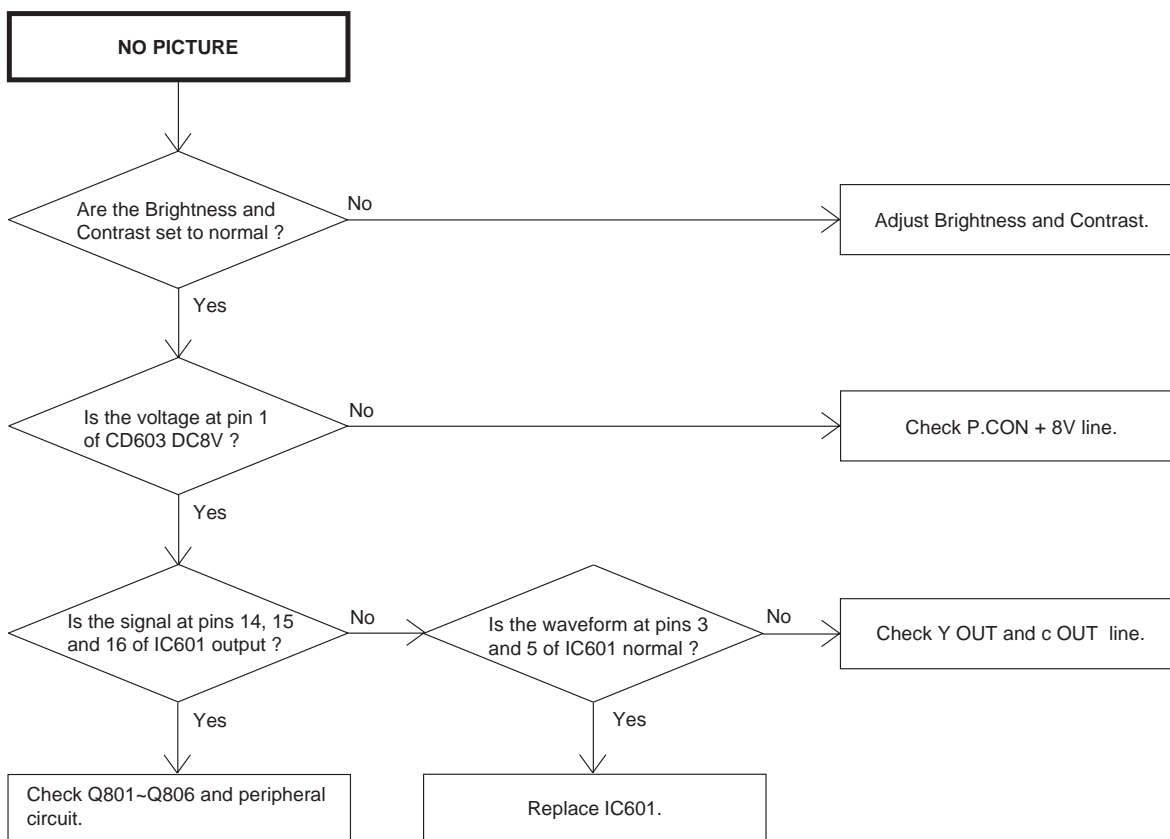


TROUBLESHOOTING GUIDE

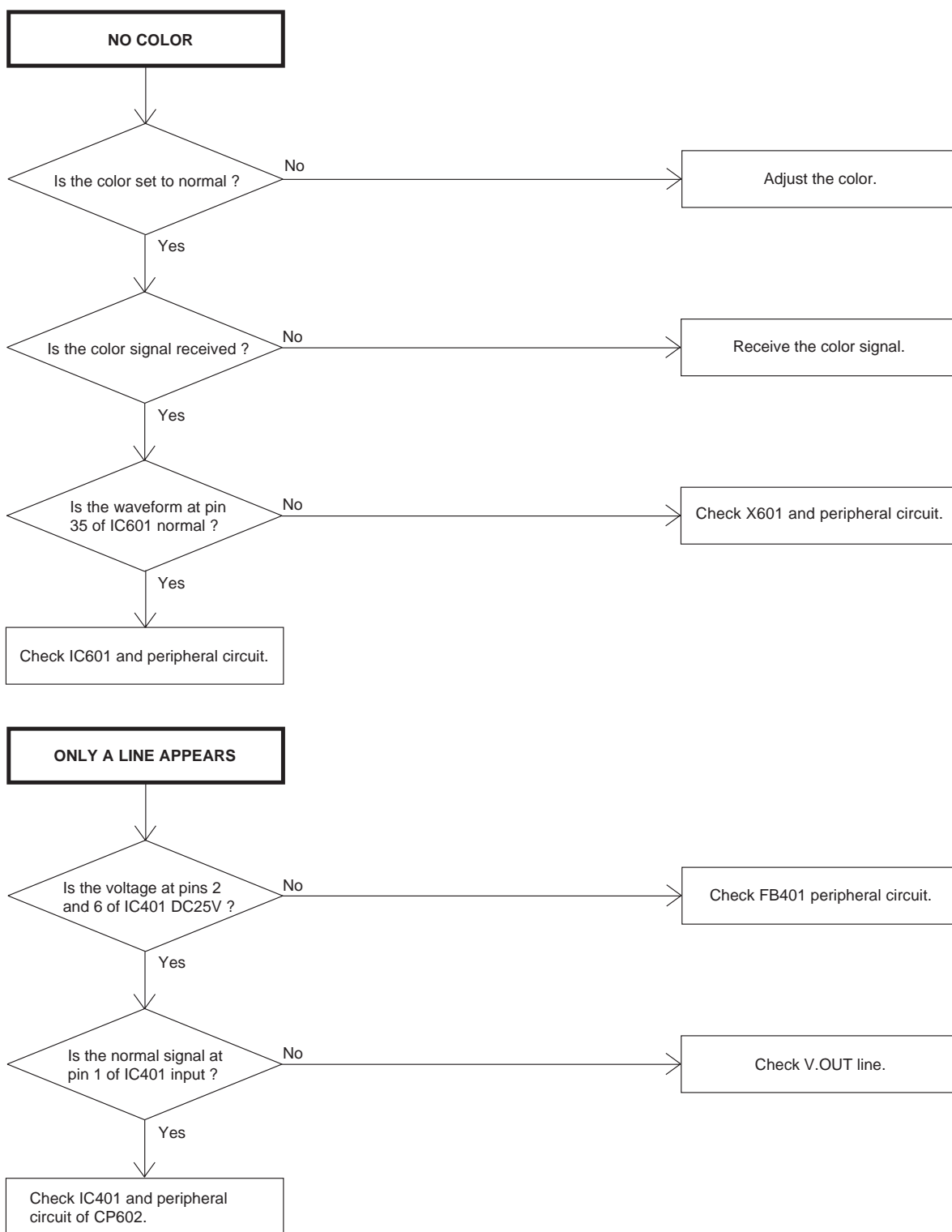
(TV SECTION)



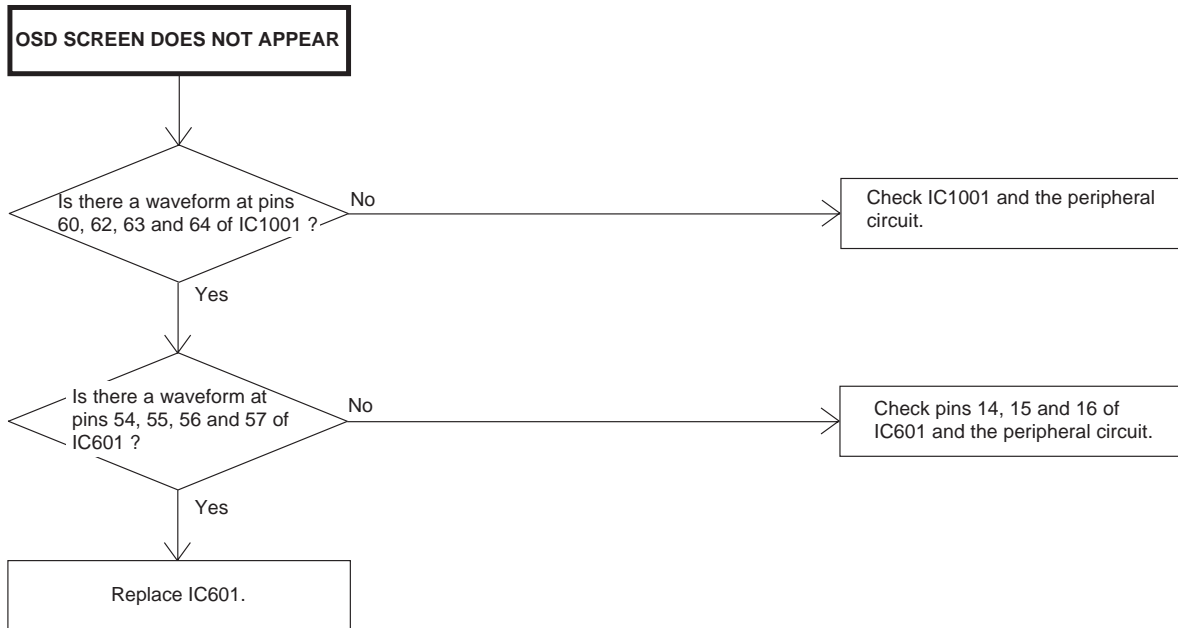
TROUBLESHOOTING GUIDE



TROUBLESHOOTING GUIDE

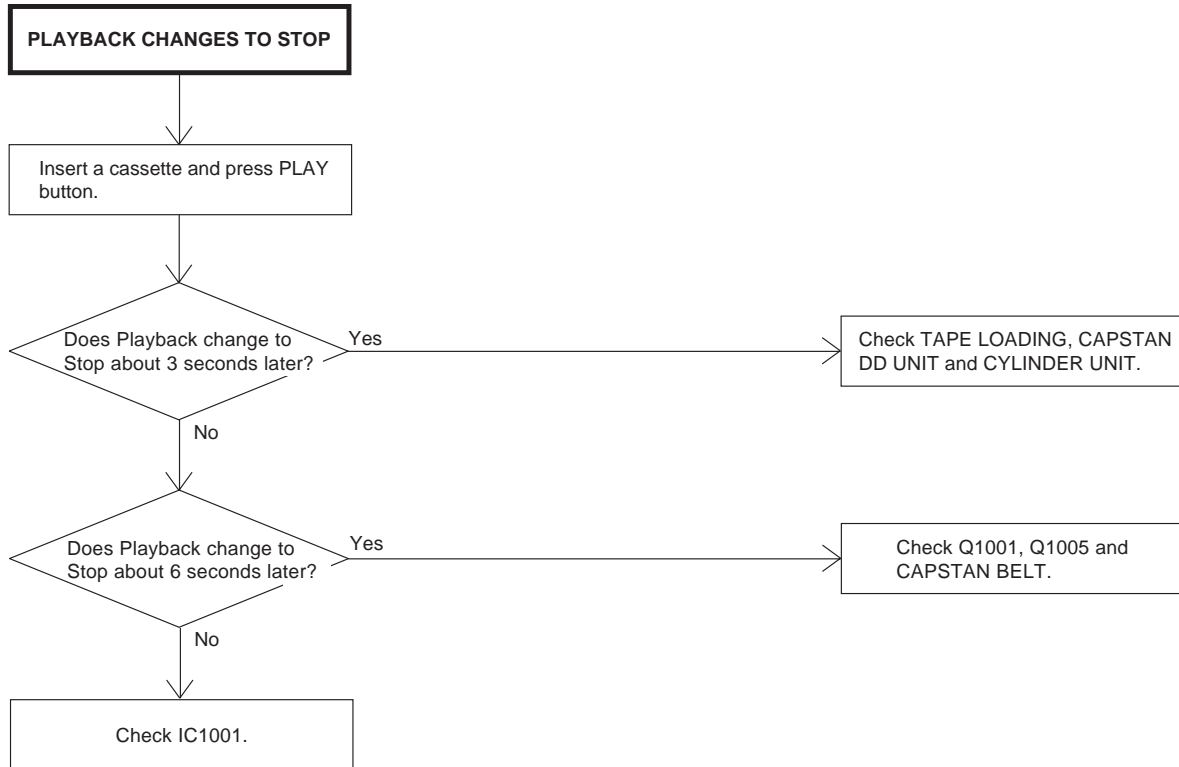


TROUBLESHOOTING GUIDE

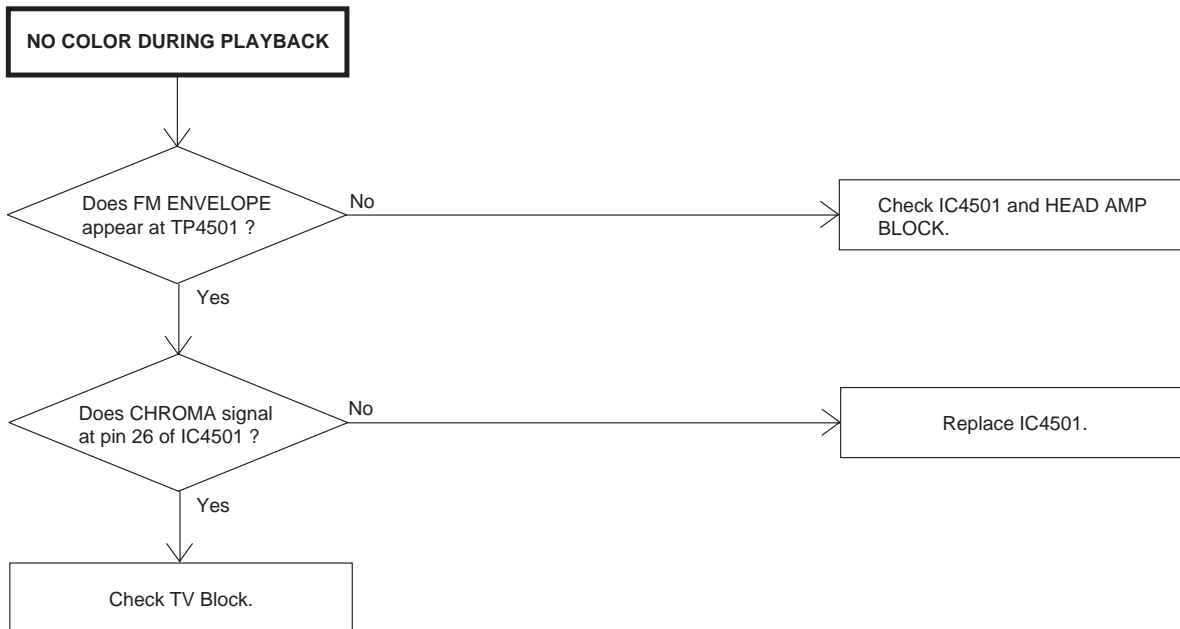
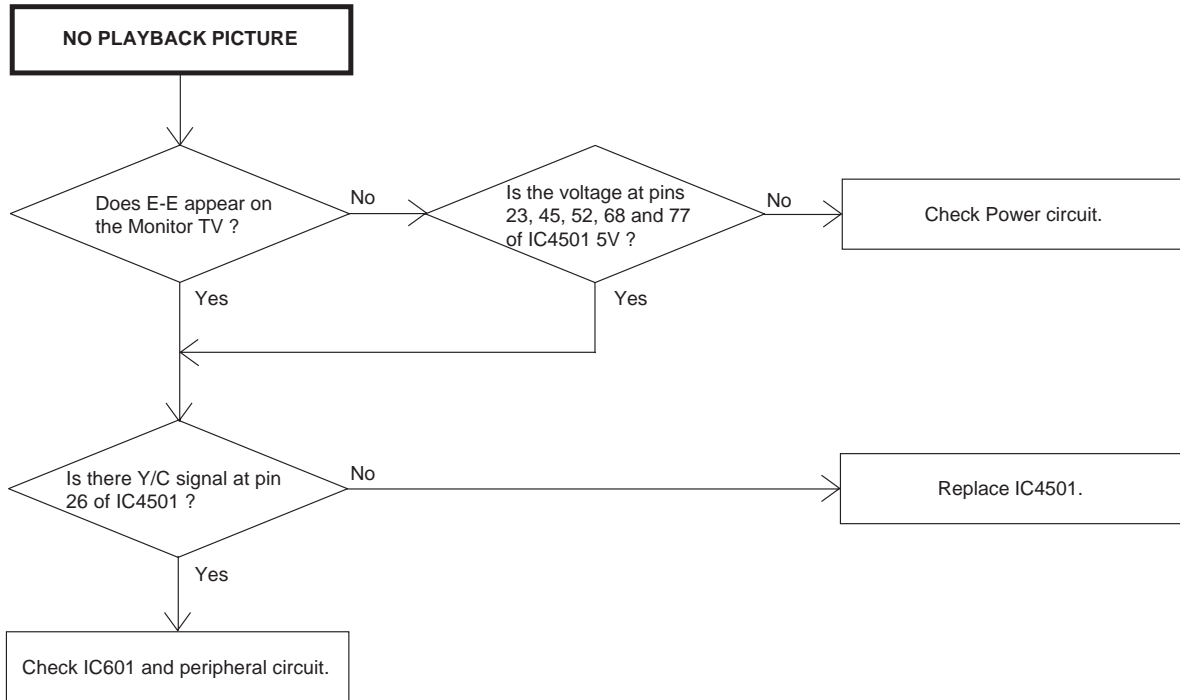


TROUBLESHOOTING GUIDE

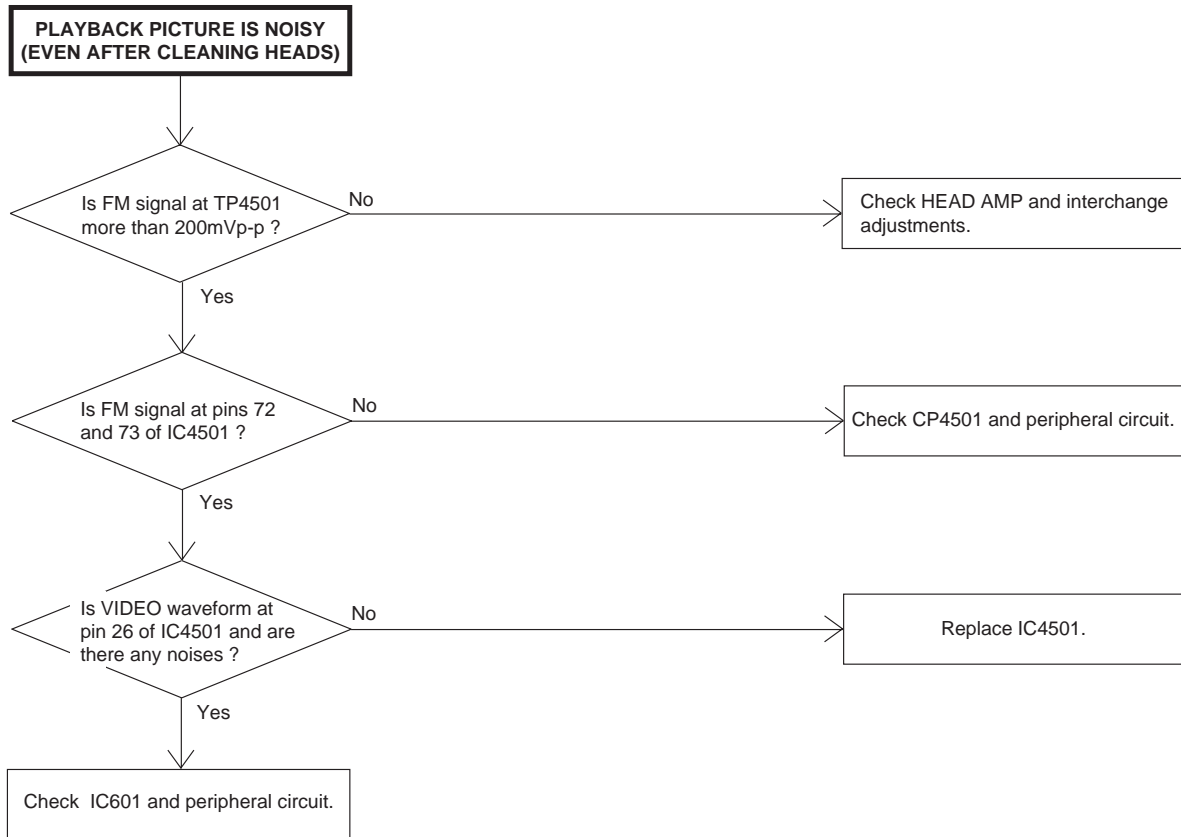
(VCR SECTION)



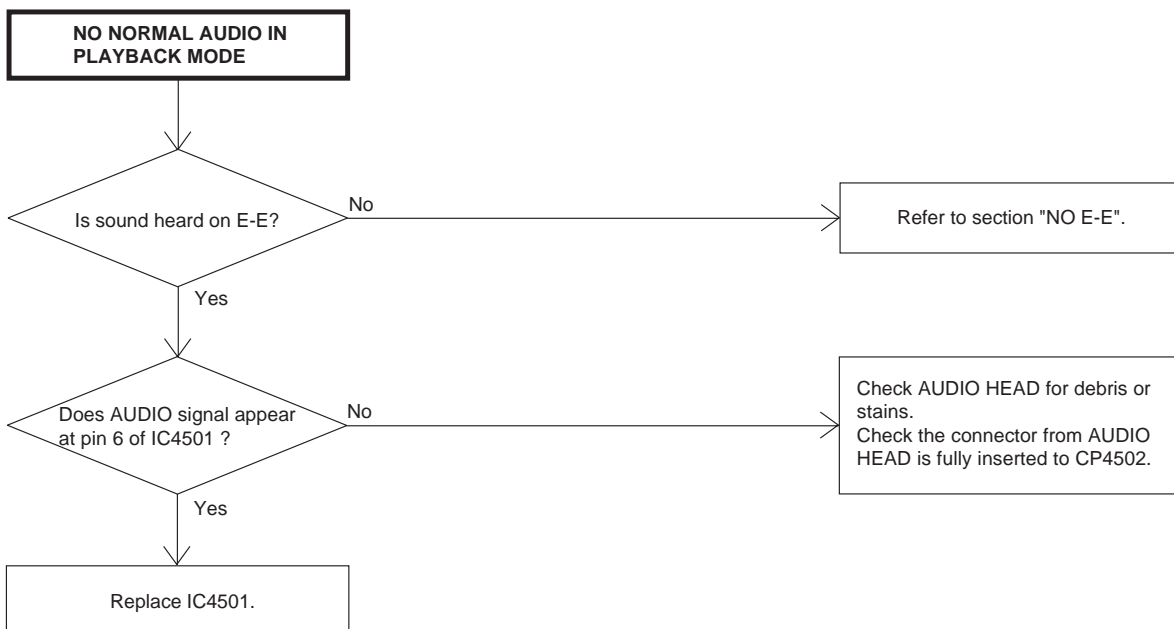
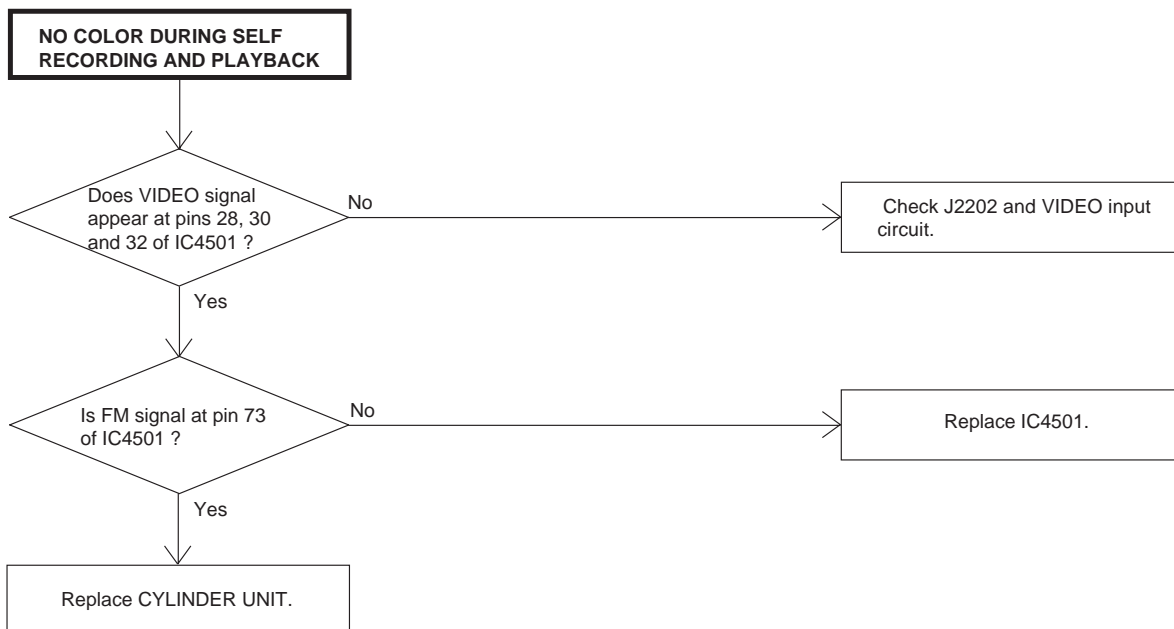
TROUBLESHOOTING GUIDE



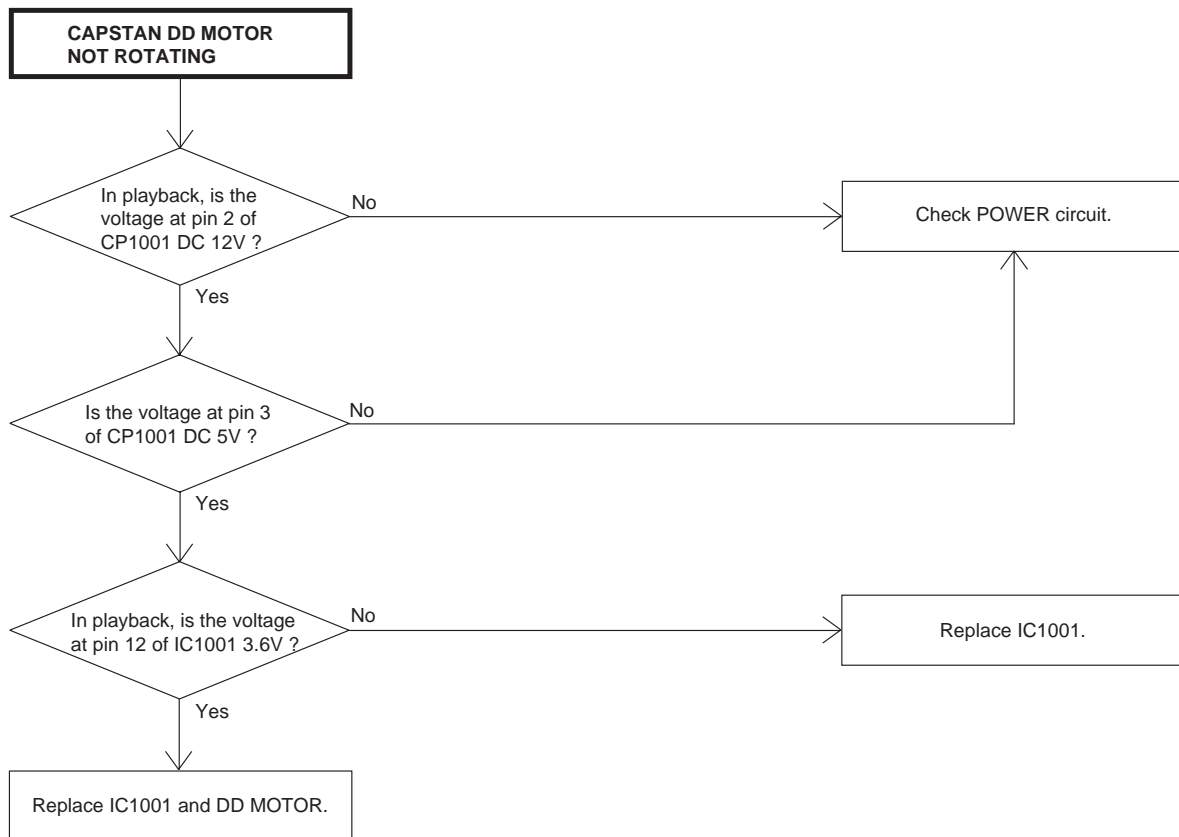
TROUBLESHOOTING GUIDE



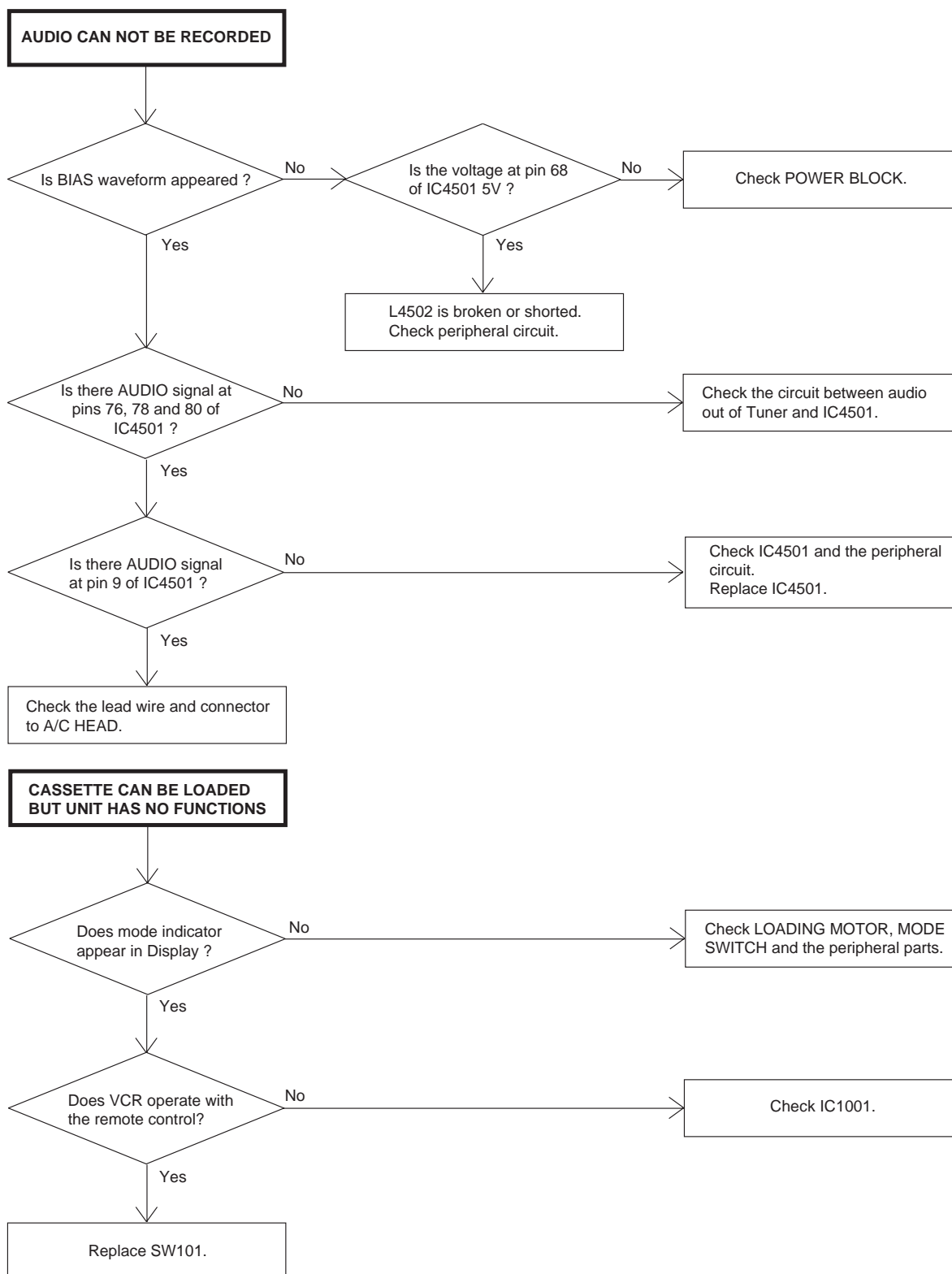
TROUBLESHOOTING GUIDE



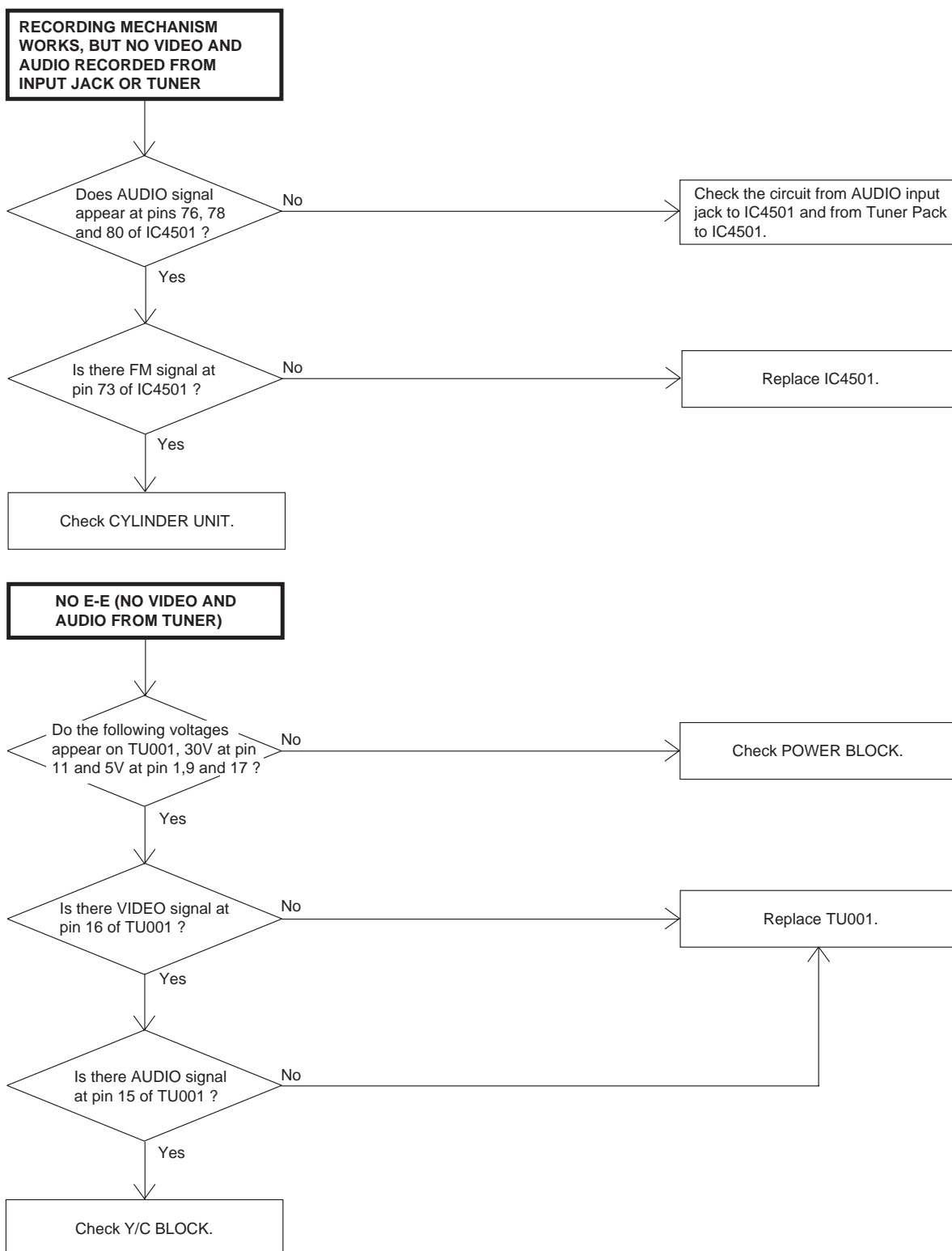
TROUBLESHOOTING GUIDE



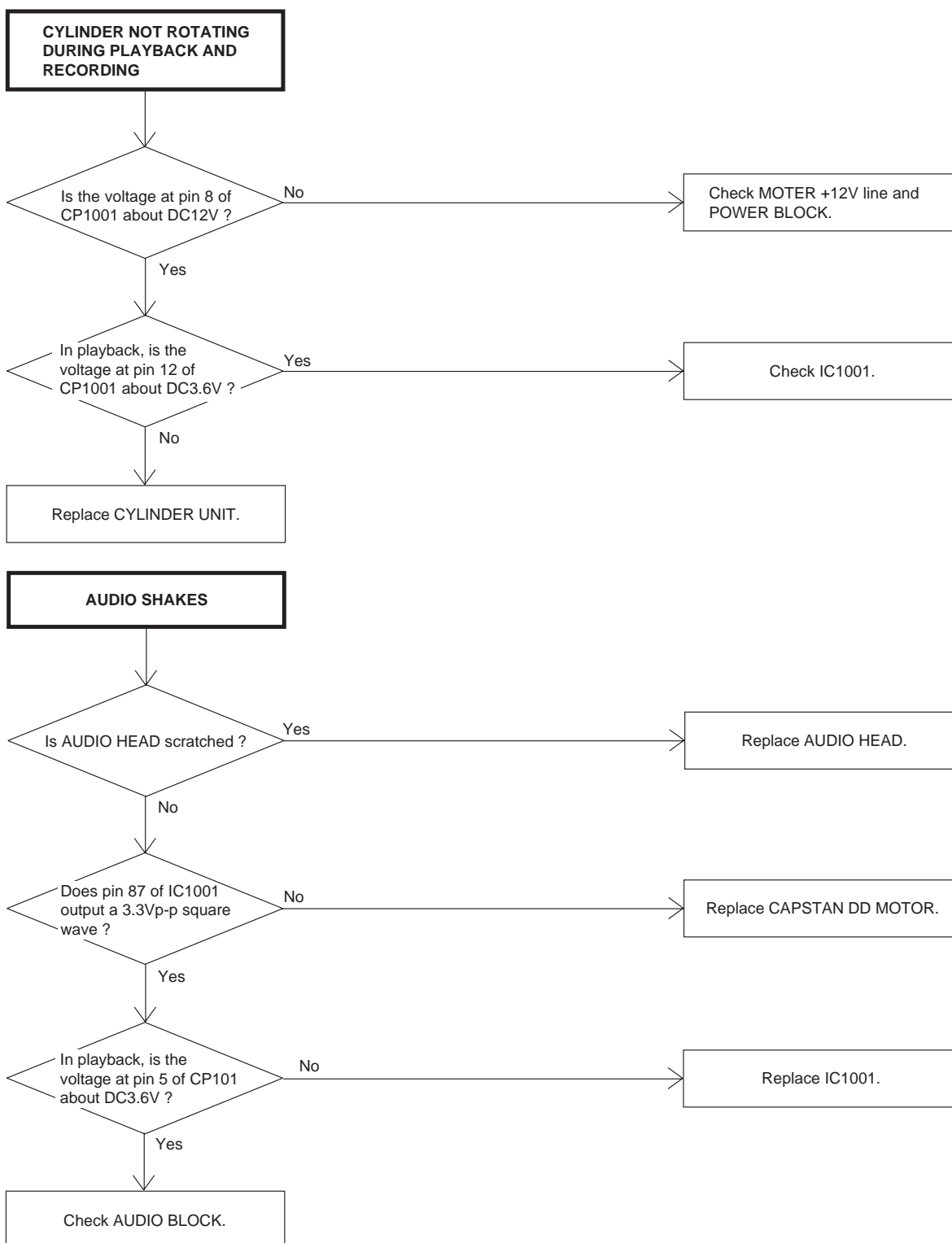
TROUBLESHOOTING GUIDE



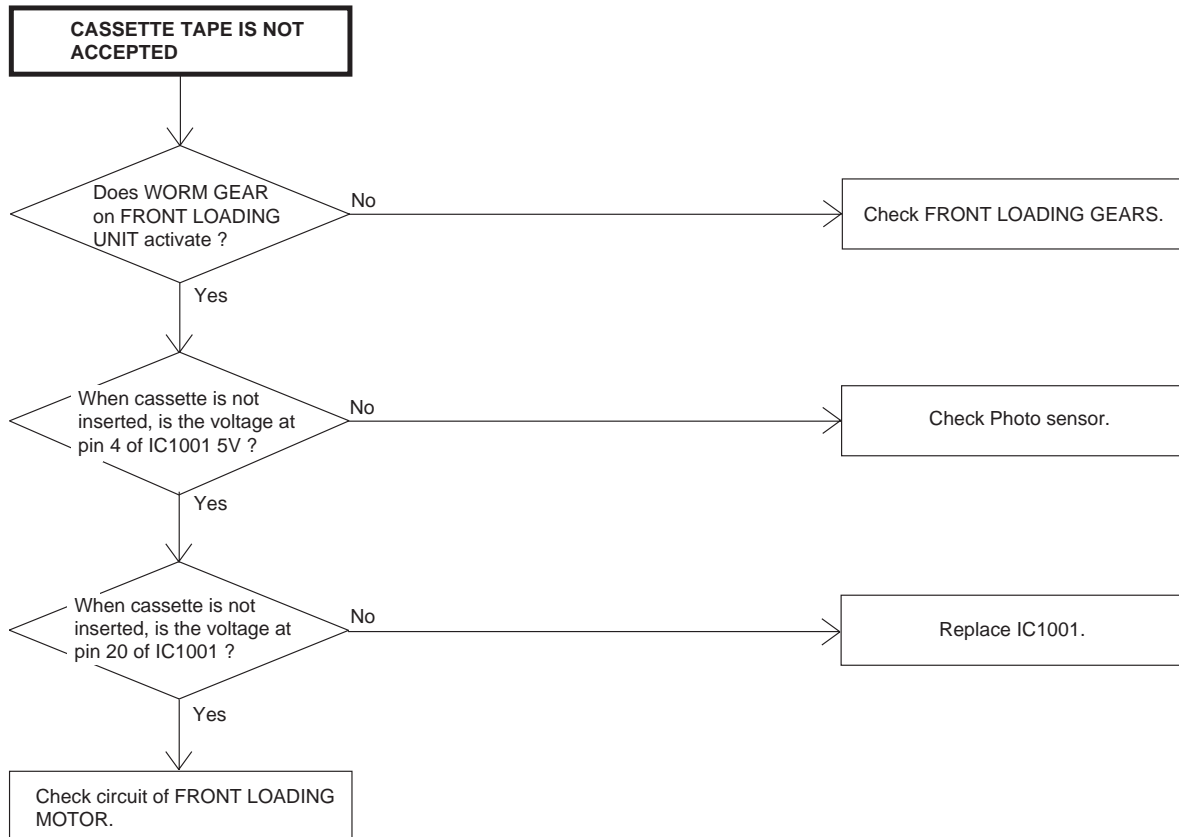
TROUBLESHOOTING GUIDE



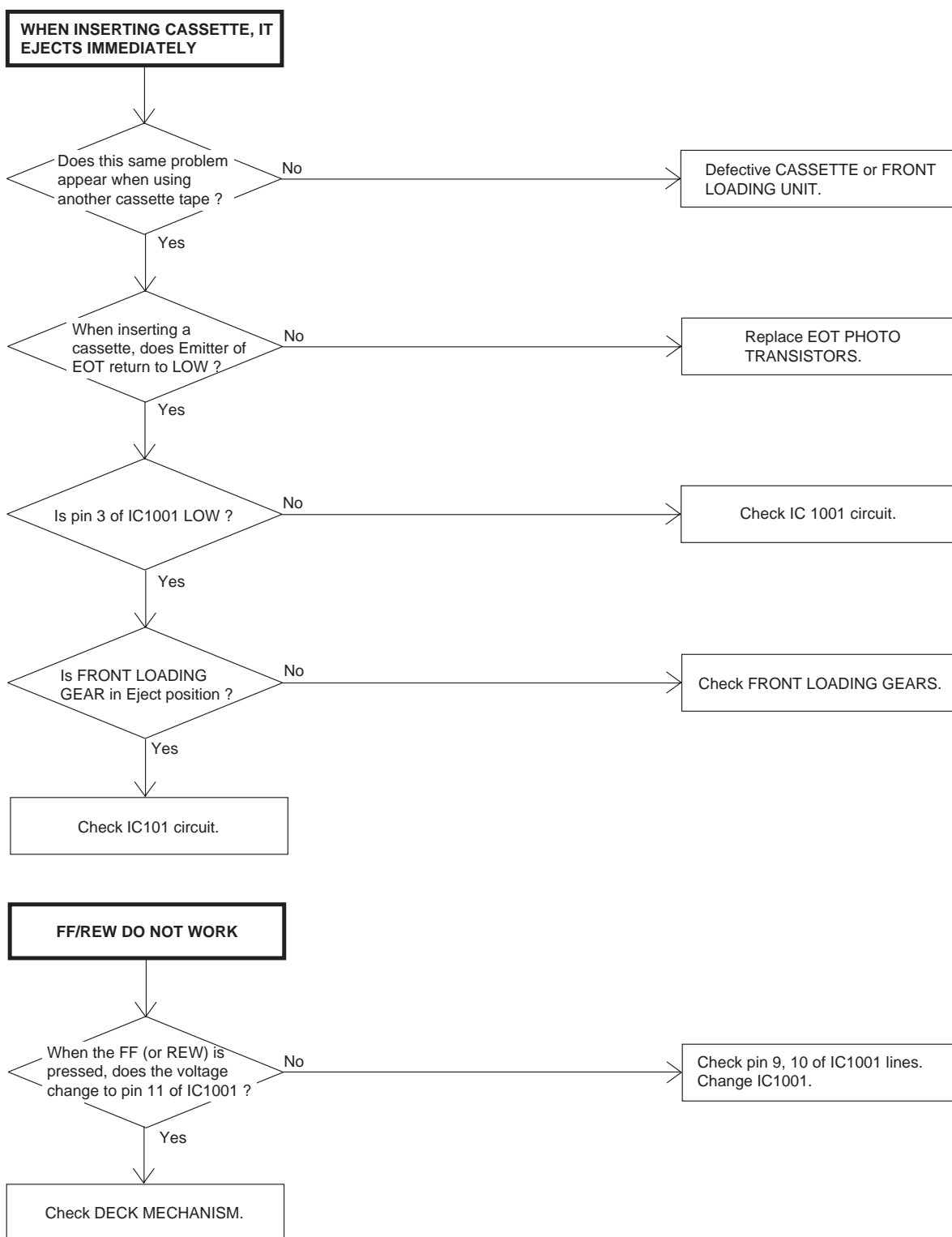
TROUBLESHOOTING GUIDE



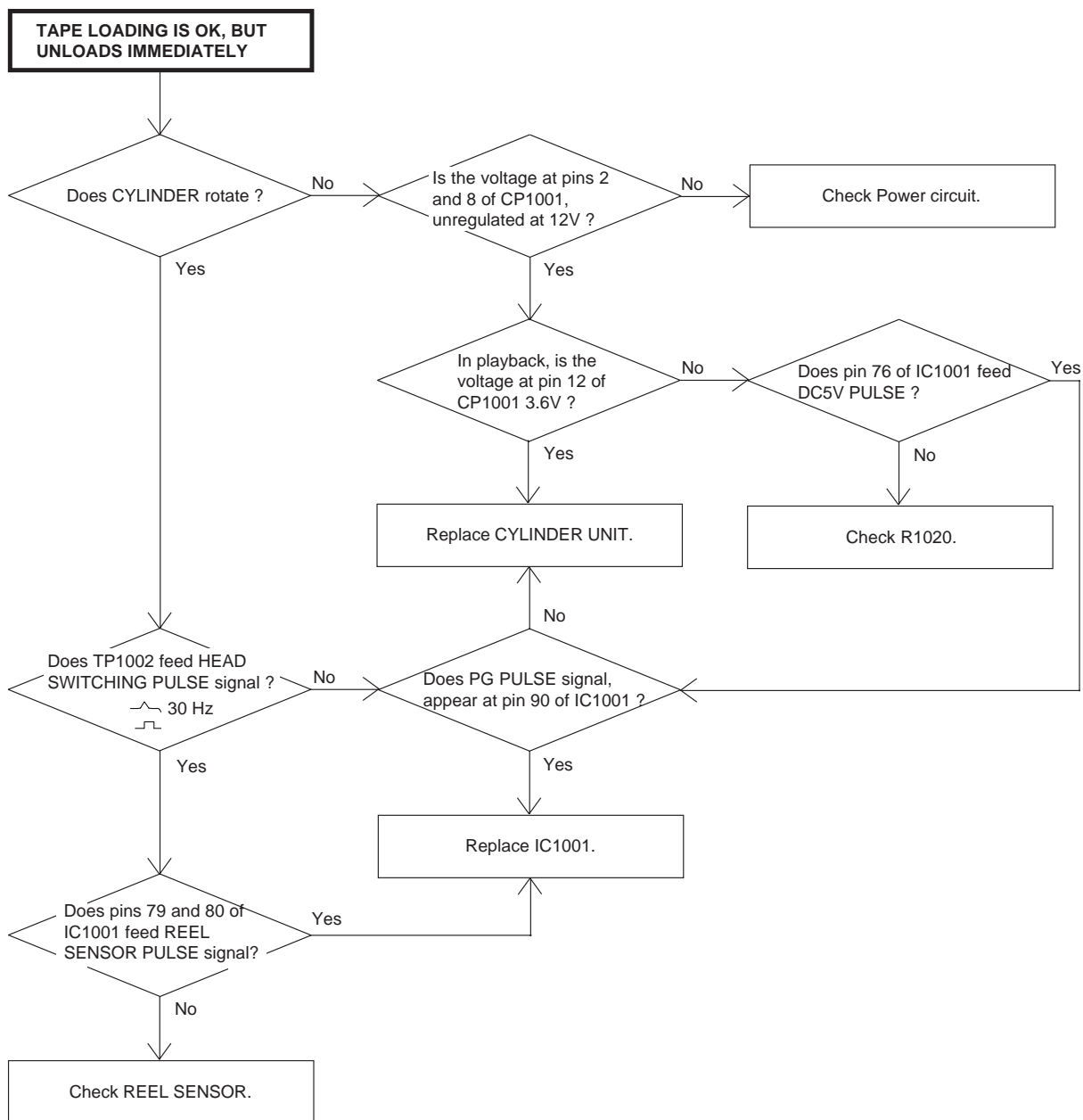
TROUBLESHOOTING GUIDE



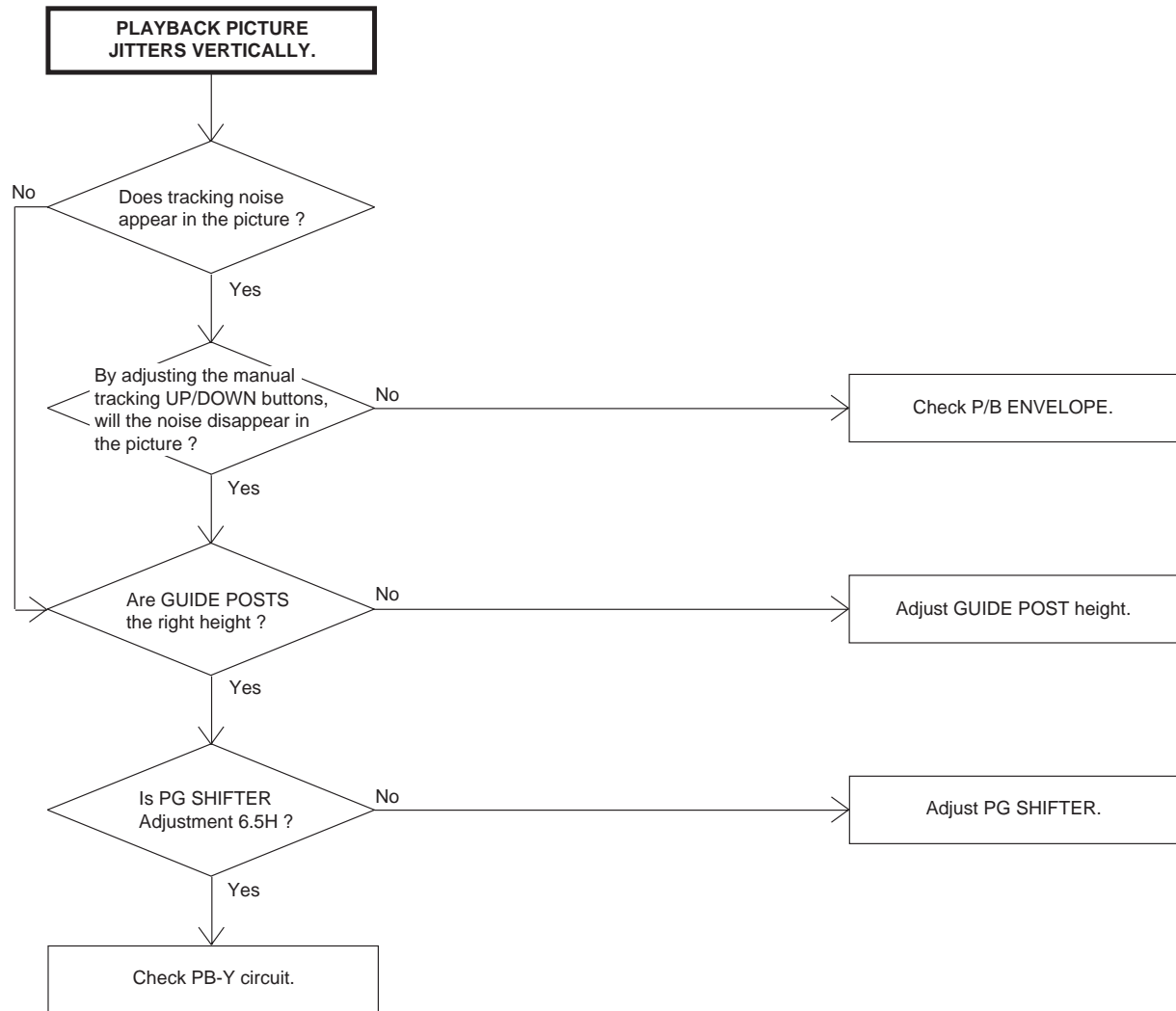
TROUBLESHOOTING GUIDE



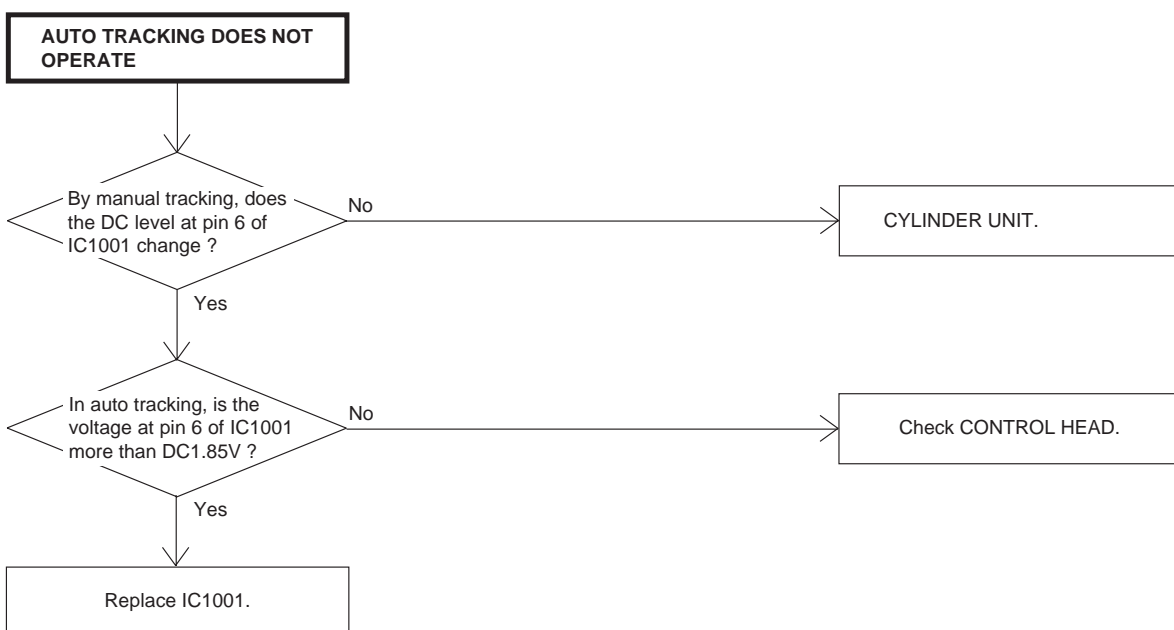
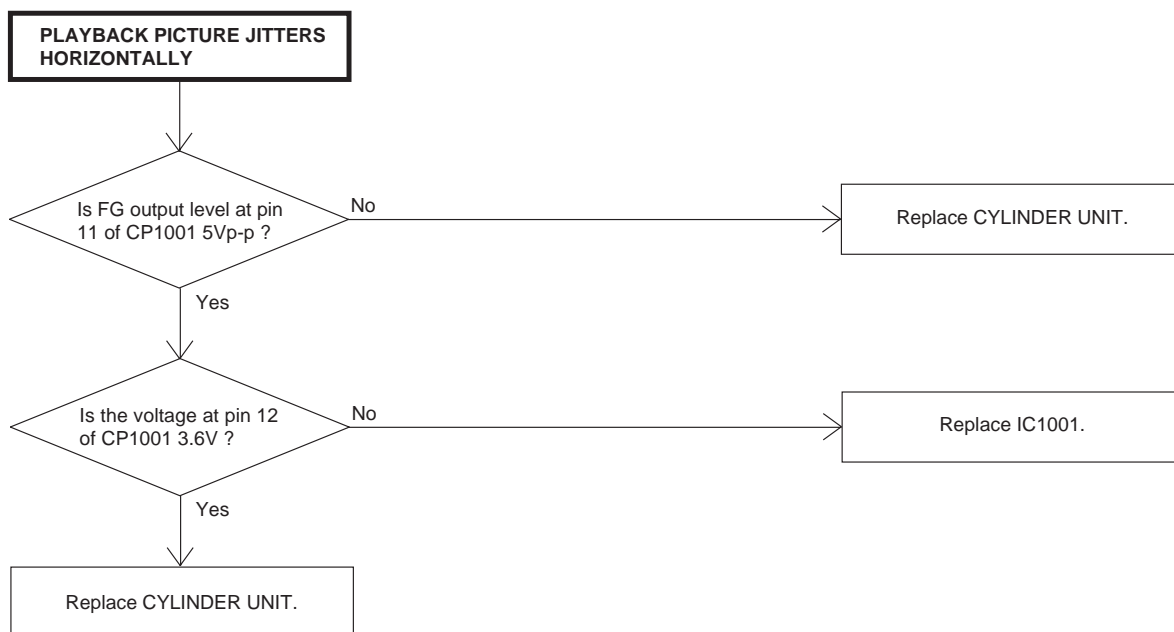
TROUBLESHOOTING GUIDE



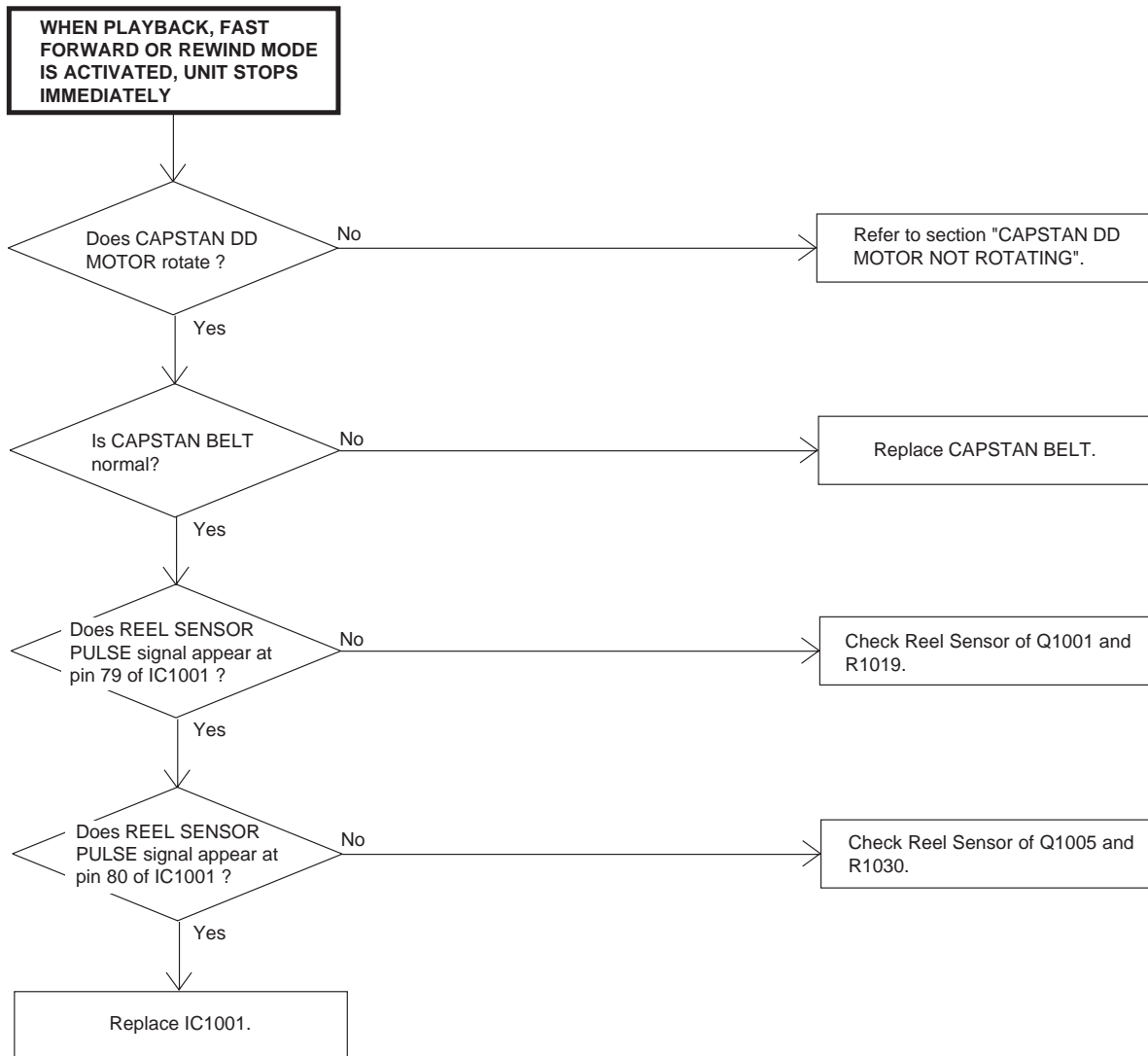
TROUBLESHOOTING GUIDE



TROUBLESHOOTING GUIDE

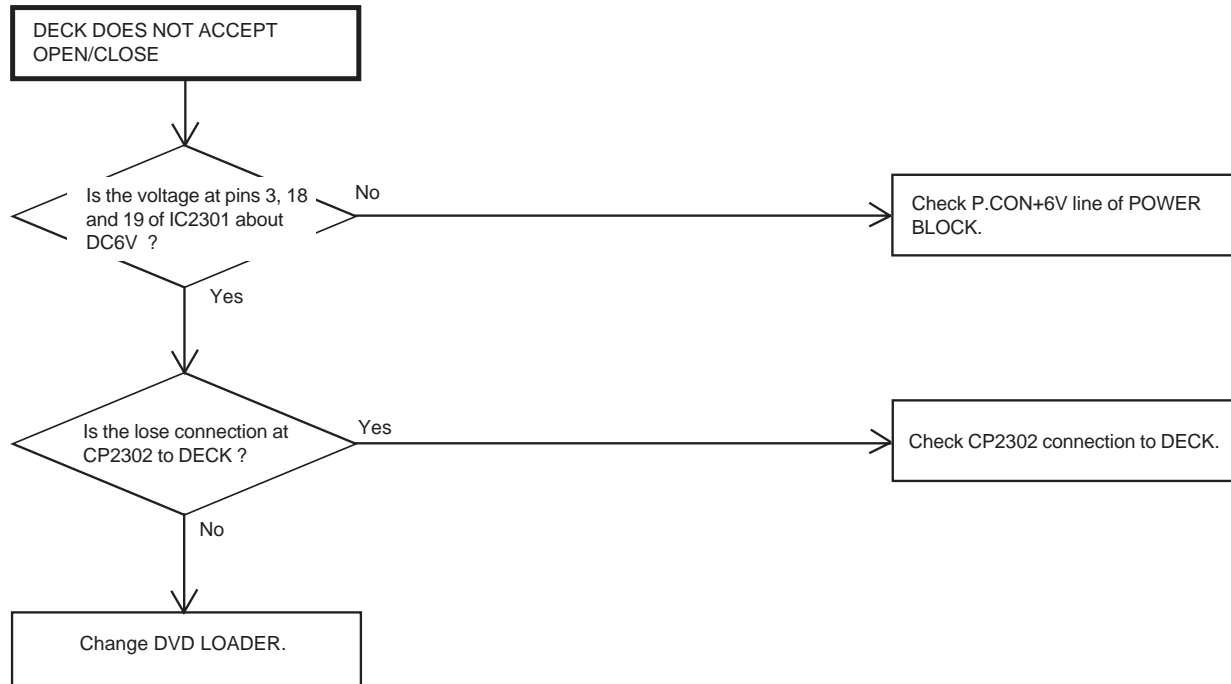


TROUBLESHOOTING GUIDE

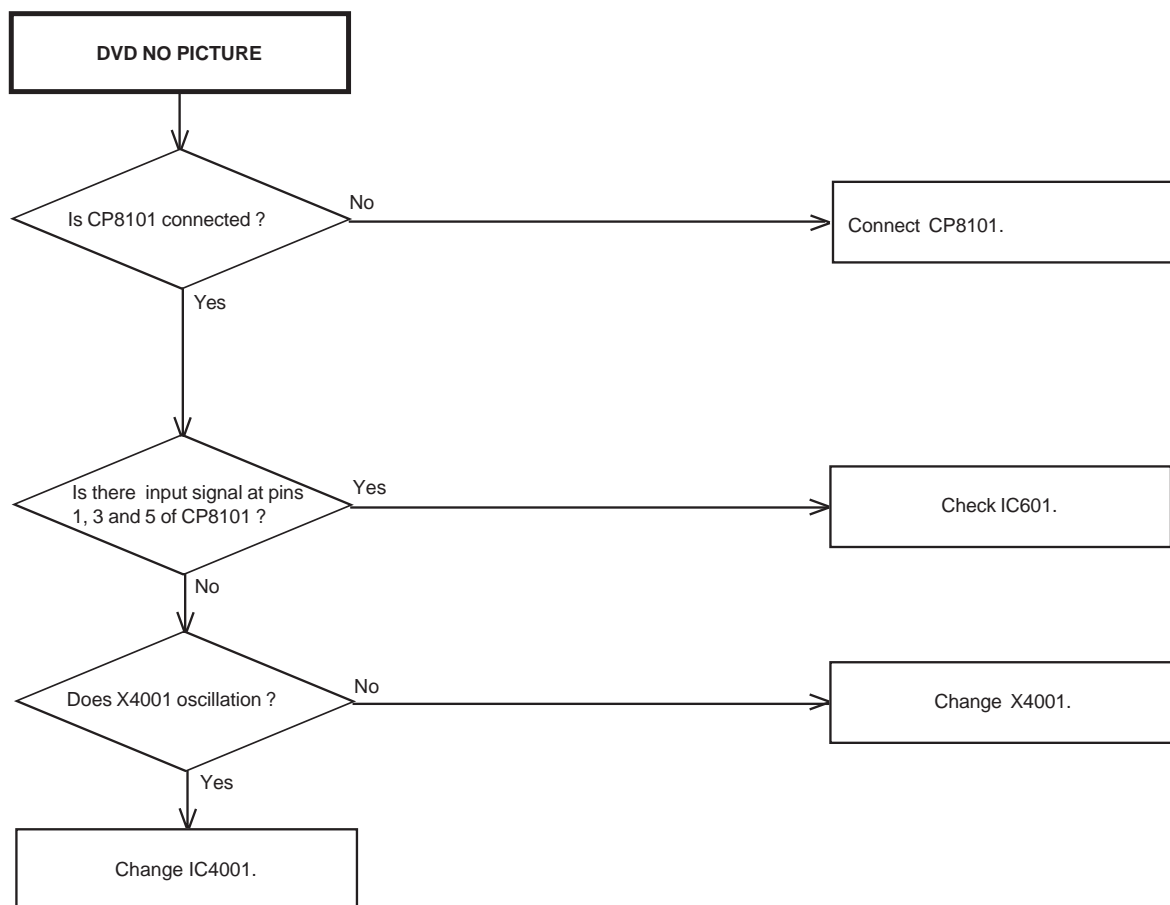


TROUBLESHOOTING GUIDE

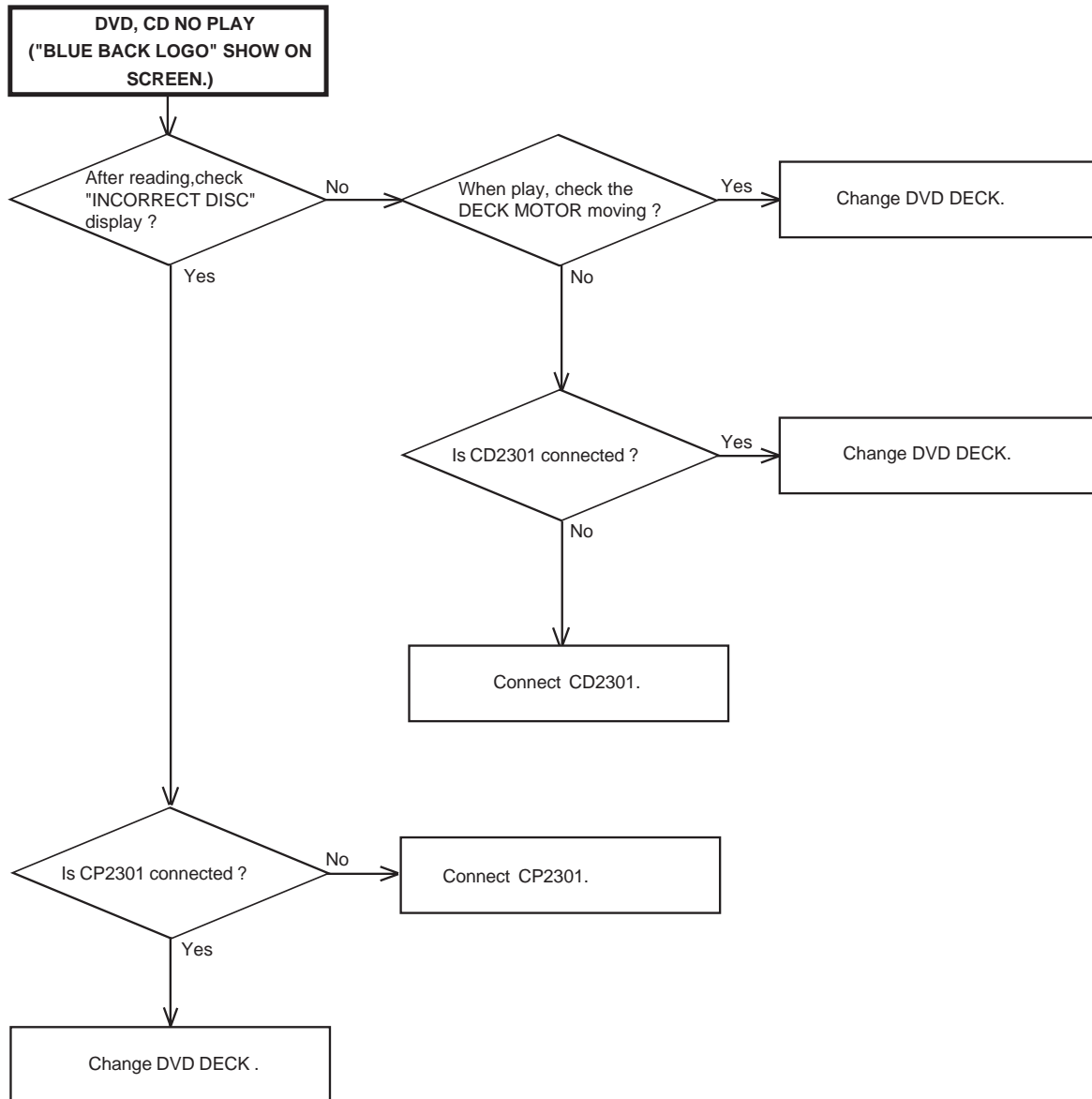
(DVD SECTION)



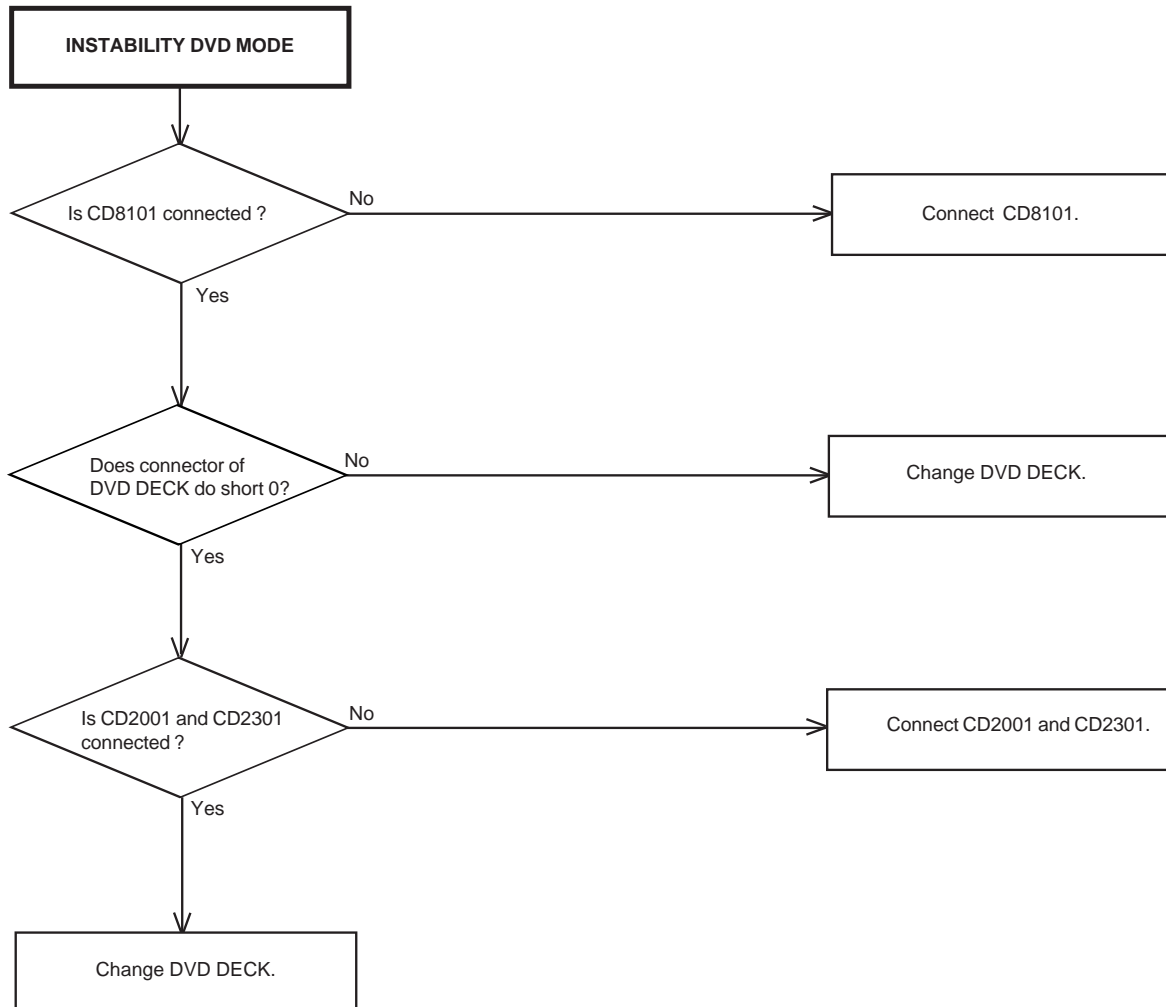
TROUBLESHOOTING GUIDE



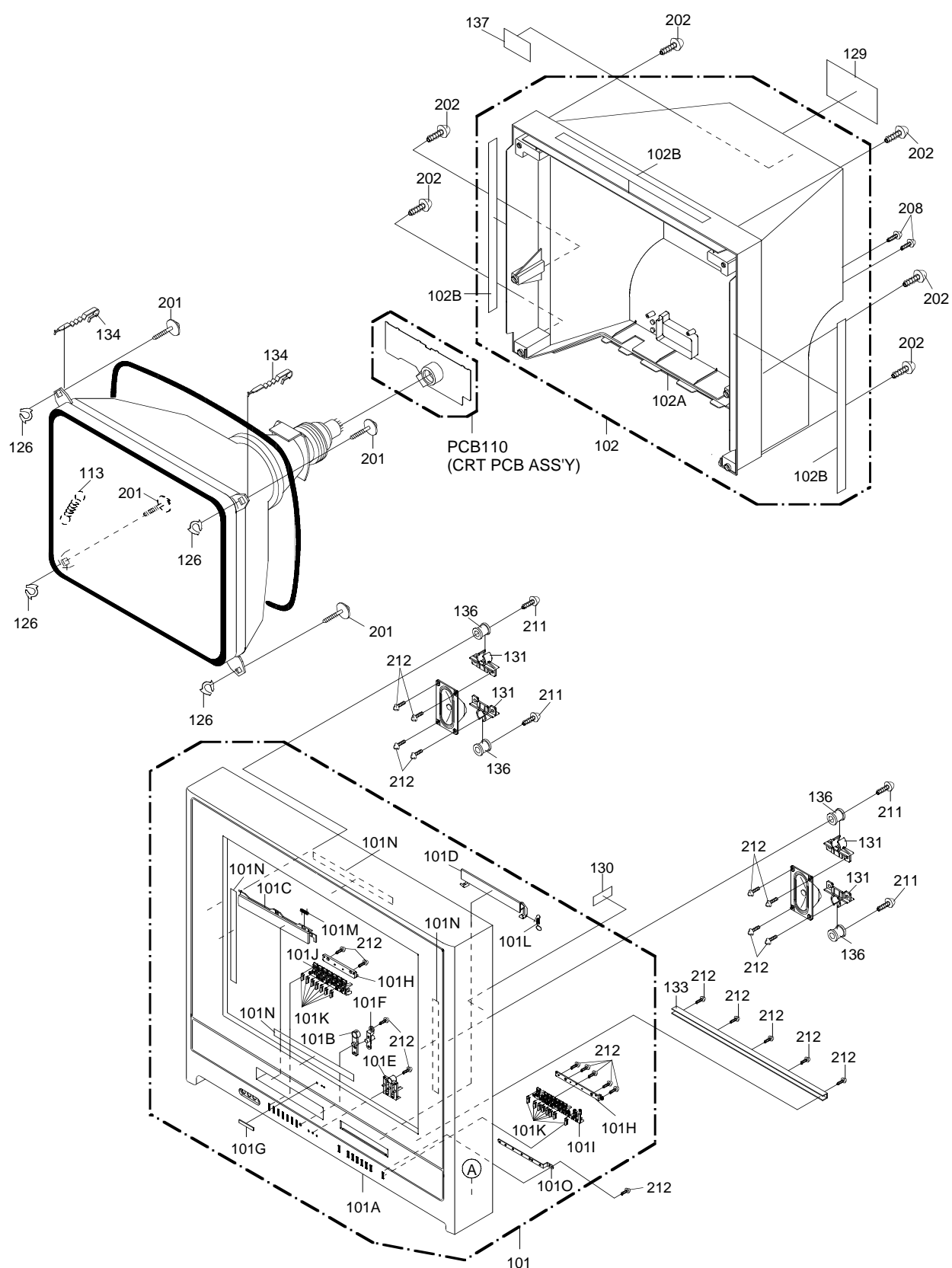
TROUBLESHOOTING GUIDE



TROUBLESHOOTING GUIDE

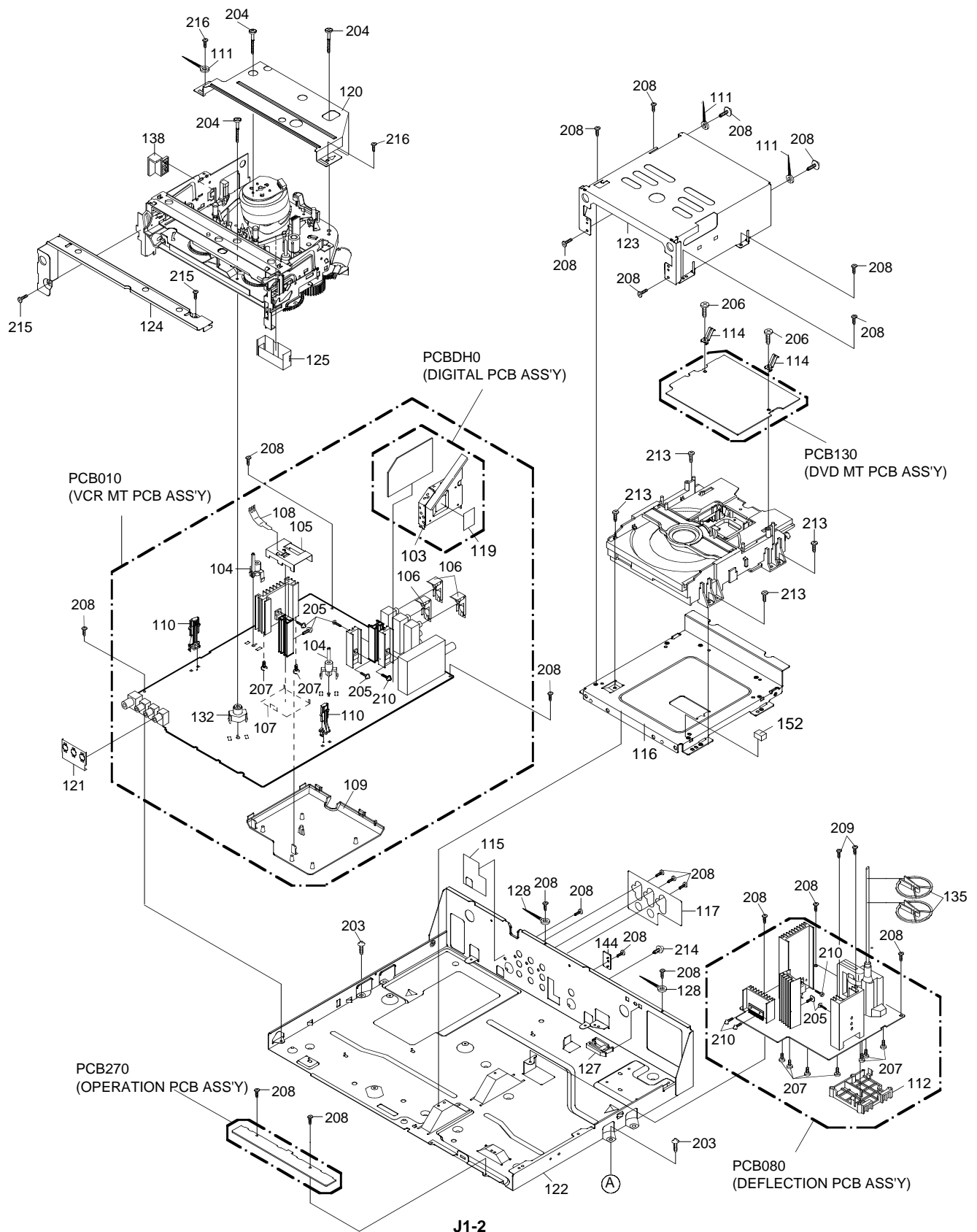


MECHANICAL EXPLODED VIEW

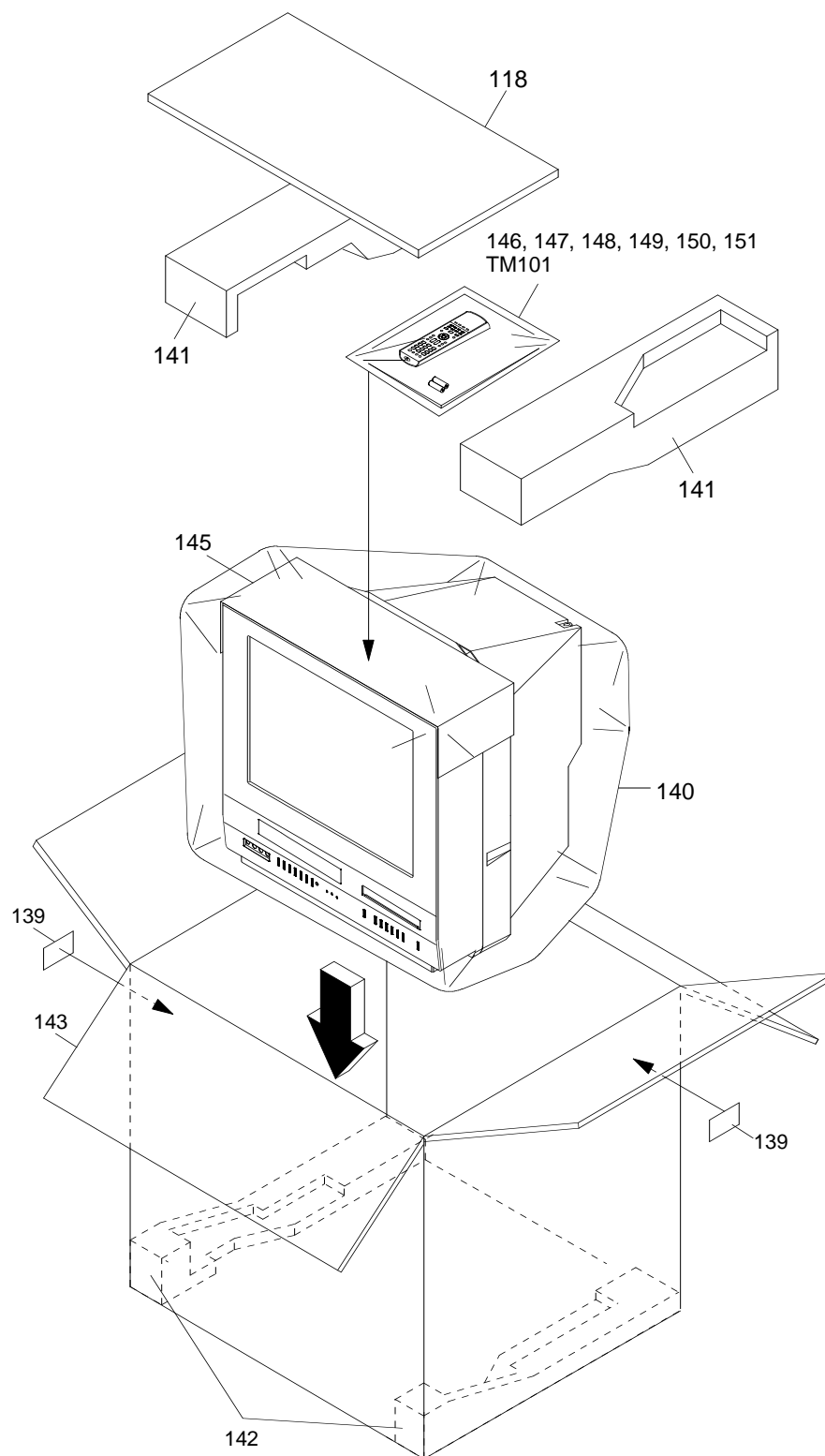


J1-1

MECHANICAL EXPLODED VIEW

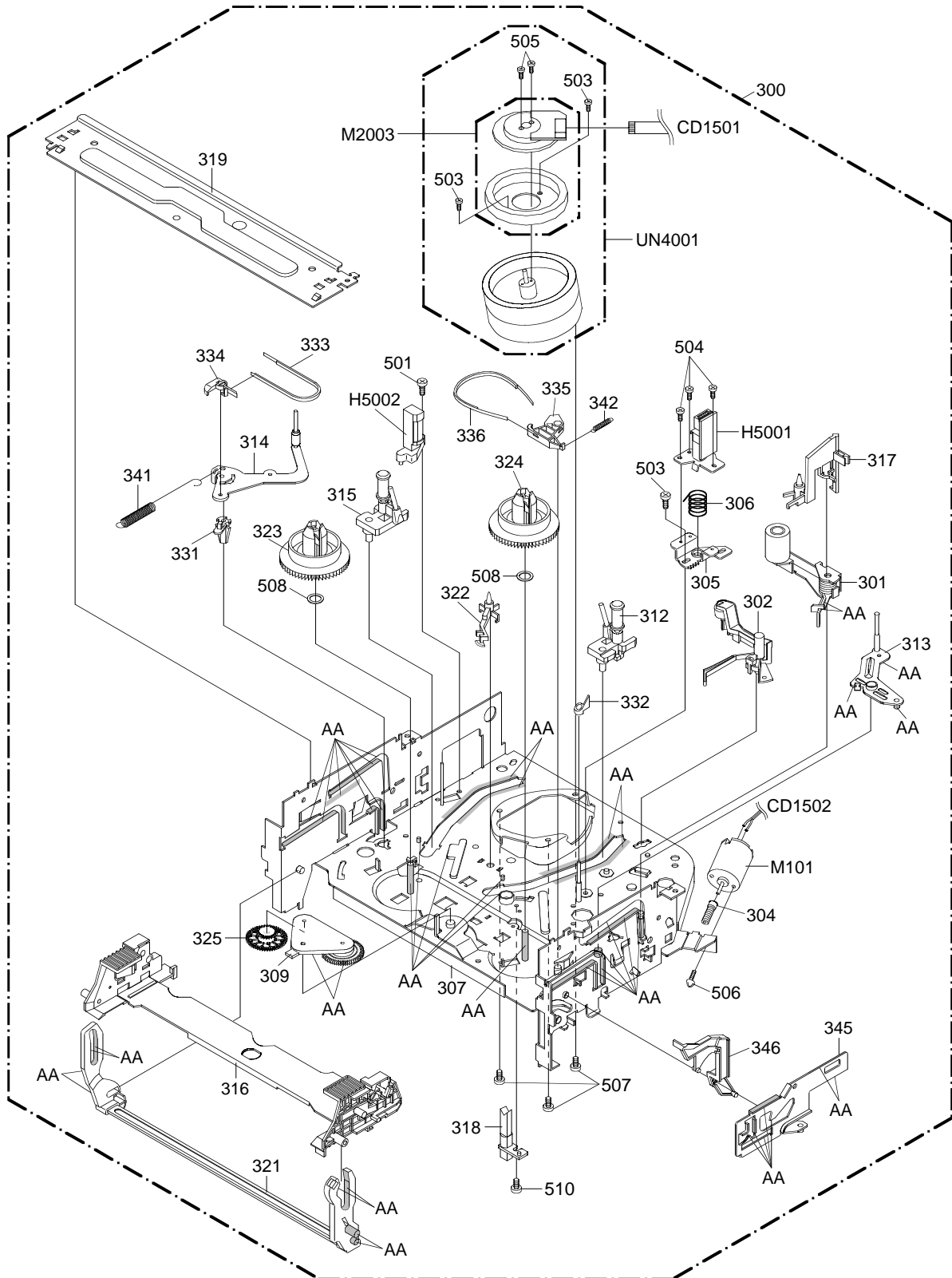


MECHANICAL EXPLODED VIEW (PACKING DIAGRAM)



J1-3

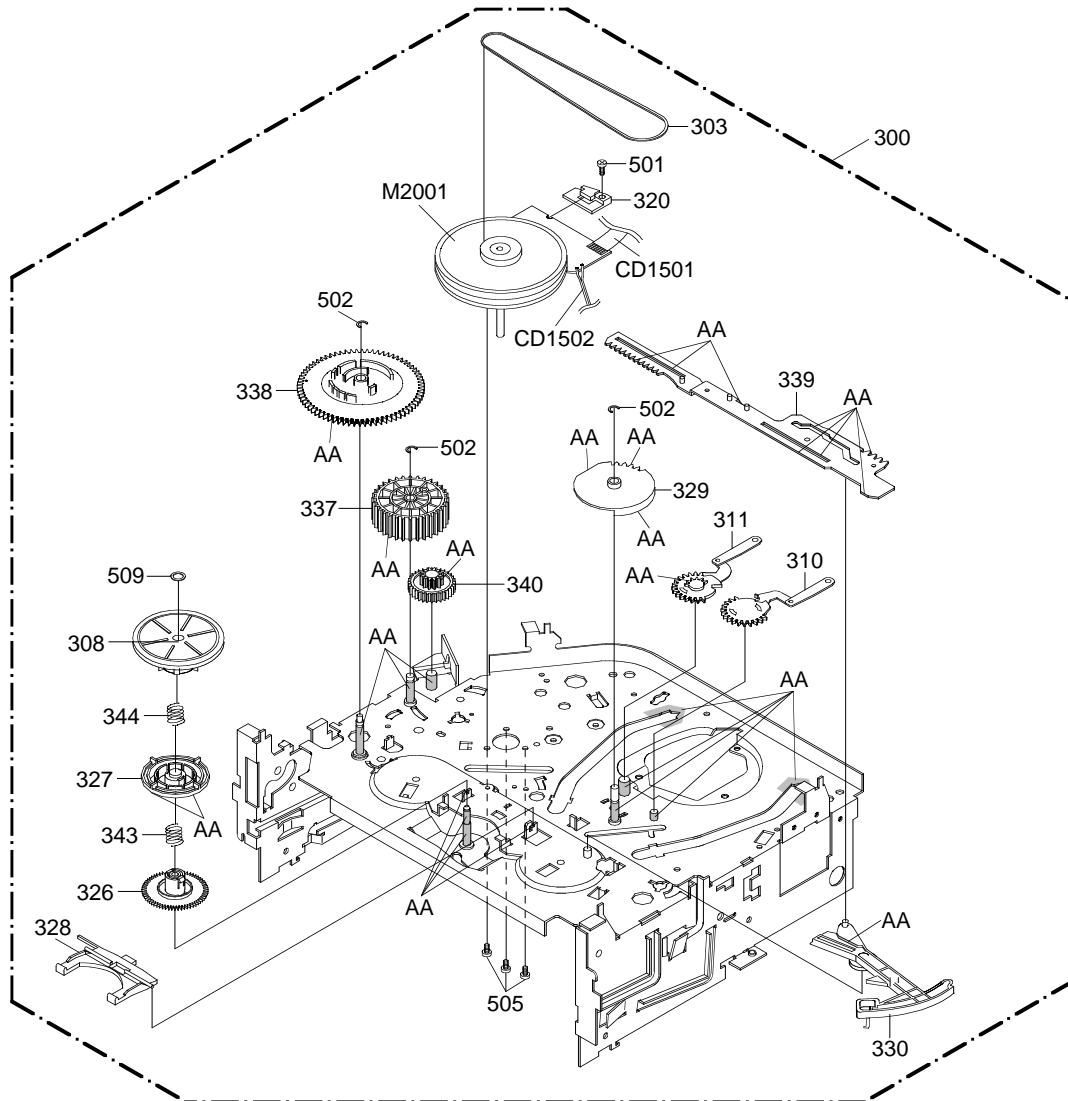
CHASSIS EXPLODED VIEW (TOP VIEW)



CLASS	MARK
GREASE	AA

NOTE: Applying positions AA for the grease are displayed for this section.
Check if the correct grease is applied for each position.

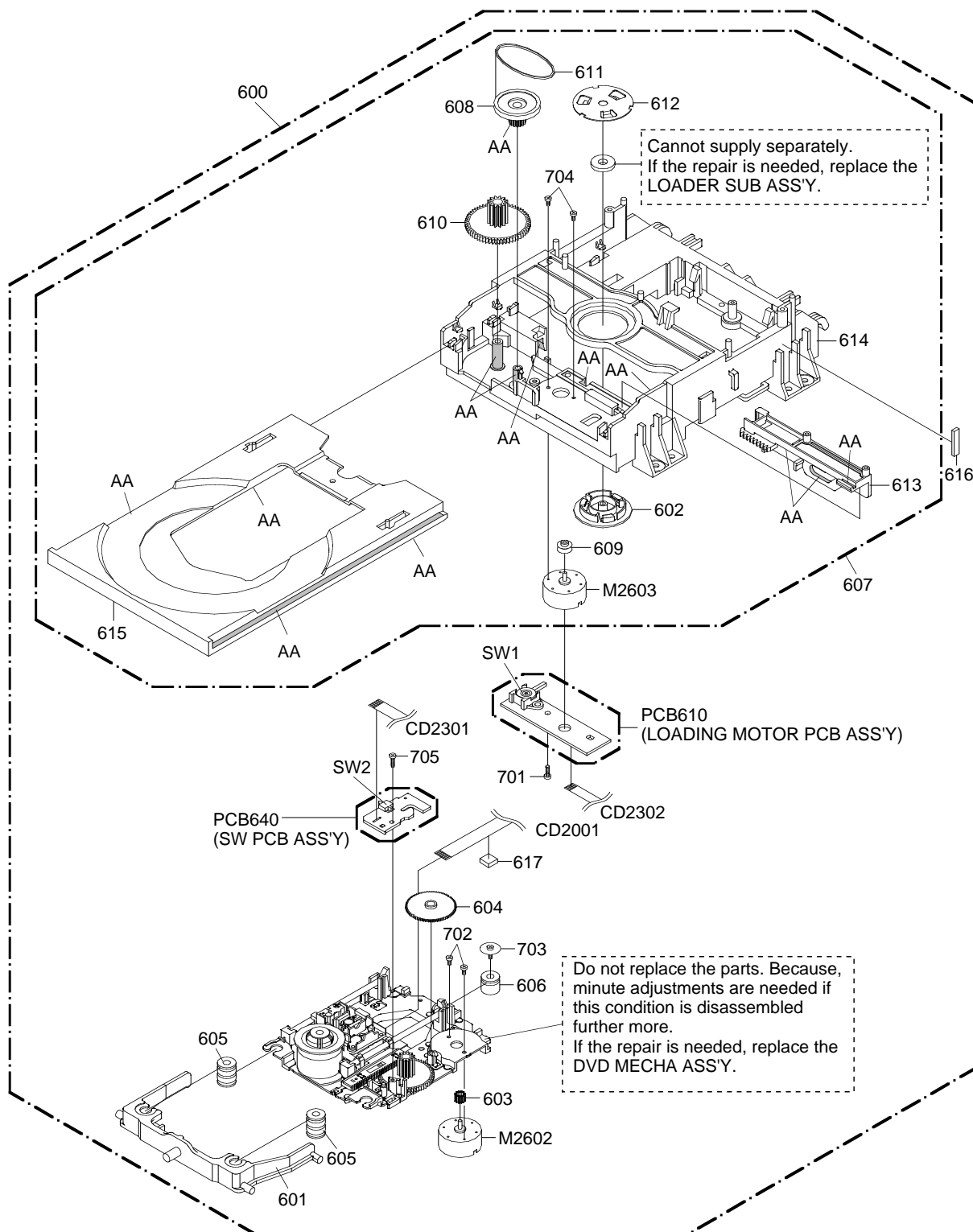
CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CLASS	MARK
GREASE	AA

NOTE: Applying positions AA for the grease are displayed for this section.
Check if the correct grease is applied for each position.

DVD DECK EXPLODED VIEW



CLASS	MARK
GREASE	AA

NOTE: Applying positions AA for the grease are displayed for this section. Check if the correct grease is applied for each position.

MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
101	75006480	7A701A870A	FRONT CABI ASS'Y
101A	75006481	701WPJD418	CABINET FRONT
101B	75002712	711WPA0275	PLATE FRONT
101C	75006482	712WPJC313	FLAT FLAP
101D	75006483	712WPJC314	FLAP DVD
101E	72798520	713WPA0311	GLASS,LED
101F	72798521	713WPA0312	GUIDE,REMOCON
101G	72783192	723549A054	BADGE BRAND
101H	72798592	735WPA0805	STOPPER,BUTTON
101I	72799739	735WPAA843	BUTTON,FRAME-DVD
101J	72799740	735WPAA844	BUTTON,FRAME-VCR
101K	72799786	735WPEA002	BUTTON CAP
101L	72798625	742WKA0001	SPRING DVD-FLAP
101M	72795666	743WKA0037	SPRING FLAP
101N	72796103	800WQ0A052	FELT SHEET
101O	72798653	752WSAA068	SHIELD BUTTON,DVD
102	75006484	7A702A266A	BACK CABI ASS'Y
102A	75006485	702WPAB023	CABINET BACK
102B	72794728	800WQ0A090	FELT,SHEET
103	75006373	7G7520045A	SHIELD BOTTOM ASS'Y
104	72795674	701WPA0751	HOLDER DECK
105	72795675	752WSA0230	SHIELD CASE H/AMP
106	72795676	752WSA0290	SHIELD COMPO
107	72798637	752WSA0308	SHIELD,COVER H/AMP
108	72795677	753WUAA006	SPRING EARTH H/AMP
109	72783452	755WPAA033	COVER PCB
110	72795679	85OP700038	HOLDER END SENSOR
111	72795699	899EFBA002	WIRING-CLIP
112	72795681	761WPA0223	HOLDER FBT
113	72795687	741WUA0021	SPRING EARTH
114	72798655	753WUA0069	SPRING EARTH
115	72799703	7250000596	SHEET,PC
116	72783863	761WSA0375	ANGLE,DECK
117	75006285	7230008260	SHEET JACK
118	72781110	795WCDA025	PAD
119	75006289	800WR00081	SHEET SILICONE
120	75006287	752WSAA133	SHIELD COVER DECK
121	72795690	752WSA0292	SHIELD AV JACK
122	75006288	752WSA0628	PLATE BOTTOM
123	72783856	752WSA0559	DVD,TOP
124	72799870	752WSAA080	VCR,TOP
125	72798638	752WSA0327	SHIELD,COVER FPC
126	72799963	769WSAA008	WASHER CRT T=0.5
127	72798687	774WPA0005	HOLDER WIRE-2
128	72795680	8995034000	CORD CLIP UL CO.
129	75006486	722549A686	SHEET RATING
130	72799615	723000C727	SHEET CAUTION
131	72796254	761WPAA115	HOLDER SPEAKER
132	72795673	701WPA0686	HOLDER DECK
133	75006291	752WSAA138	ANGLE FRONT
134	72798684	762WPA0011	HOLDER CRT WIRE
135	72794734	899HV3T000	HOLDER ANODE WIRE
136	72794733	801WR00001	DAMPER SPEAKER
137	72783403	726000A131	SHEET CRT SERVICEMAN
138	72798660	755WPAA012	PLATE COVER LIGHT (L)
139	75006487	723000D494	SHEET BAR CODE
140	72794741	791WHAA116	FILM,BAG
141	72798713	792WHA0520	PACKAGE,TOP
142	72798714	792WHA0521	PACKAGE,BOTTOM
143	75006488	793WCDD387	GIFT BOX
144	72783871	706WPA0017	COVER,CONNECTOR
145	72782503	791WHAA138	LIGHTRON SHEET

MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
146	75002750	JB5ND500	POLYBAG INSTRUCTION(RED CAUTION)
147	72781569	J3N51617A	REGISTRATION CARD
148	72781605	J5S10229A	INFORMATION SHEET(RETURN)USA
149	75006295	J5V60128B	WARNING SHEET
150	75006296	J5Y40101A	INSTRUCTION BOOK
151	75006297	J5Y40107A	QUICK SET-UP SHEET
152	72781978	8965TS1017	CUSHION 65TS10-10(17.5*20*14)
201	72798796	8141H60C5U	SCREW,TAP TITE(P) GW20 6*35 CH HEXAGC
202	72798795	8117540B0U	SCREW TAPPING(B0) TRUSS 4*20 CH
203	72798794	811754080U	SCREW TAPPING(B0) TRUSS 4*8 CH
204	72781243	8109130B9U	SCREW TAP TITE(B)R PAN 3*29 CH
205	72798789	8109I30A0U	SCREW TAP TITE(B) WH7 3*10 CH
206	72795782	811022680U	SCREW TAP TITE(P) BIND 2.6*8 CH
207	72781251	810963080Q	SCREW TAP TITE(B) BRAZIER 3*8 STAINLES
208	72798787	810923080U	SCREW TAP TITE(B) BIND 3*8 CH
209	72781237	8107630A8U	SCREW,TAP TITE(S) BRAZIER 3*18 CH
210	72798786	810763080U	SCREW TAP TITE(S) BRAZIER 3*8 CH
211	72781295	8162540A6U	SCREW TAPPING (BO) WASHER 18
212	72798790	811063080U	SCREW TAP TITE(P) BRAZIER 3*8 CH
213	72781263	810F13080U	SEMS(F) 3*8 CH
214	72798785	810723040U	SCREW TAP TITE(S) BIND 3*4 CH
215	72781235	810723060U	SCREW TAP TITE(S) BIND 3*6 CH
216	72781247	810923060U	SCREW TAP TITE(B) BIND 3*6 CH

CHASSIS REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
300	72783455	A5T410J420A	DECK ASSY A5T410J420A
301	72795710	85OA400245	PINCH ROLLER BLOCK VA2
302	72795711	85OA500026	AHC ASS'Y
303	72795712	85OP200290	BELT,CAPSTAN (S)
304	72795713	85OP600581	WORM
305	72795714	85OP500091	BASE,AC HEAD
306	72795715	85OP800324	SPRING,AC HEAD
307	72795716	85OA000528	MAIN CHASSIS ASS'Y
308	72795717	85OA200089	CLUTCH ASS'Y
309	72795718	85OA200092	ARM IDLER ASS'Y
310	72795719	85OA300068	LOADING ARM S UNIT
311	72795720	85OA300070	LOADING ARM T UNIT
312	72795721	85OA400223	INCLINED BASE T UNIT 3S
313	72795722	85OA400249	P5 ARM ASS'Y 2
314	72795723	85OA400248	TENSION ARM ASS'Y 2
315	72795724	85OA400231	INCLINED BASE S UNIT
316	72795725	85OA900234	CASS HOLDER ASS'Y
317	72795726	85OP900745	CASS,OPENER
318	72795727	85OP700035	REFLECTOR,LED
319	72795728	85OP900755	BRACKET,TOP 3V
320	72795729	85OP400554	HOLDER,CAPSTAN
321	72795730	85OA900233	LINK UNIT
322	72795731	85OP000496	POST,CASS GUIDE
323	72795732	85OP200316	REEL,S (S)
324	72795733	85OP200317	REEL,T (S)
325	72795734	85OP200308	GEAR,IDLER
326	72795735	85OP200311	GEAR,CLUTCH
327	72795736	85OP200312	GEAR,COUPLING
328	72795737	85OP200313	LEVER,CLUTCH
329	72795738	85OP300194	GEAR,MAIN LOADING
330	72795739	85OP400490	LEVER,TENSION
331	72795740	85OP400492	HOLDER,TENSION
332	72795741	85OP400520	CAP,P4
333	72795742	85OP400542	BAND,TENSION
334	72795743	85OP400533	CONNECT,TENSION
335	72795744	85OP600573	ARM,BRAKE T
336	72795745	85OP600584	BAND,BRAKE T
337	72795746	85OP600577	CAM,PINCH ROLLER
338	72795747	85OP600578	CAM,MAIN
339	72795748	85OP600585	ROD,MAIN
340	72795749	85OP600582	GEAR,JOINT
341	72795750	85OP800322	SPRING,TENSION
342	72795751	85OP800360	SPRING,BRAKE T
343	72795752	85OP800355	SPRING,COUPLING
344	72795753	85OP800356	SPRING,RING
345	72795754	85OP900754	LEVER,LINK
346	72795755	85OP900744	LEVER,FLAP
501	72795756	810722680U	SCREW,TAP TITE(S) BIND M2.6*8 CH
502	72795757	83ETW3000U	E-RING 3.0
503	72795758	810722640U	SCREW,TAP TITE(S) BIND M2.6*4 CH
504	72795759	810212060U	SCREW,PAN M2*6 CH
505	72795760	810912660U	SCREW,TAP TITE(B) PAN M2.6*6 CH
506	72795761	810A13040U	SCREW/WASHER(A) M3*4 CH
507	72795762	810A12650U	SCREW/WASHER(A) M2.6*5 CH
508	72795763	82Q264713N	POLYSLIDER WASHER 2.6*4.7*T0.13
509	72795764	82P184505N	POLYSLIDER WASHER(CUT) 1.8*4.5*T0.5
510	72795765	810722660U	SCREW TAP TITE(S) BIND 2.6*6 CH
CD1501	72795865	122H071704	CORD JUMPER 2H071704
CD1502	72795866	122Y021002	CORD JUMPER 2Y021002
H5001	72795899	1523Q91003	HEAD (AUDIO CONTROL) VTR-1X2RPE22-756
H5002	72795900	1543Q02014	HEAD (FULL ERASE) VTR-1X2ERS11-154
△M101	72795944	1596S98002	MOTOR,LOADING MDB2B66B
△M2001	72795945	1510S98044	CAPSTAN DD UNIT F2QVB73B
△M2003	72795946	1589S11025	MICRO MOTOR I20AL34K
△UN4001	72783456	A5T7016500	CYLINDER UNIT ASS'Y A5T7016500

DVD DECK REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
△600	75006298	A2J901T650	DVD MECHA ASS'Y	A2J901T650
601	72795767	92P100109A	HOLDER, TRAVERSE	
602	72795768	92P100094A	CLAMPER	
603	72795769	92P100088A	GEAR, MOTOR	
604	75006299	92P100108B	GEAR, MIDDLE	
605	72795771	92P200013A	INSULATOR(F)	
606	72795772	92P200014A	INSULATOR(R)	
607	72781331	92SBB0029A	LOADER SUB ASS'Y	
608	72795774	92P100095A	GEAR, PULLEY	
609	72795775	92P100097A	PULLEY, MOTOR	
610	72795776	92P100096A	GEAR, MAIN	
611	72781328	92P200015A	BELT, LOADING	
612	72795778	92P000014A	PLATE, CLAMPER	
613	72795779	92P100093A	RACK, LOADING	
614	72795780	92P100091A	FRAME, MAIN	
615	72798838	92P100092A	TRAY	
616	72795888	800WFAA008	CUSHION C	
617	72796105	7230007850	SHEET, FFC	
701	72795782	811022680U	SCREW TAP TITE(P) BIND 2.6*8 CH	
702	72795783	814011723U	SCREW, PAN M1.7*2.3 P3 CH	
703	72795784	816112080U	SEMS, TAP TITE(P) PAN W10 2*8 CH	
704	72795785	814011730U	SCREW, PAN M1.7*3 P3 CH	
705	72796070	811022080U	SCREW, TAP TITE(P) BIND 2*8 CH	
CD2001	72783183	122J4O1903	CORD JUMPER	127000-2928
CD2301	72795869	122H062102	CORD JUMPER	2H062102
CD2302	72795870	122H052601	CORD JUMPER	2H052601
△M2602	72795947	1515S98003	FEED MOTOR	BCZ3B03B
△M2603	72795948	1596S18003	MOTOR, LOADING	BCZ3B52B
PCB610	72795956	A5R801V610	LOADING MOTOR PCB ASS'Y	DED003A
PCB640	72795957	A2F401H640	SW PCB ASS'Y	DED012B
SW1	72796050	0515S32002	SWITCH	SSS-13-2
SW2	72796052	0500101037	PUSH SWITCH	ESE22MH24

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
RESISTORS				
△R401	72781722	R4K1T4472F	R,METAL	4.7K OHM 1/4W
△R403	72781717	R4K1T4183F	R,METAL	18K OHM 1/4W
△R405	72783394	R4K1T4153F	R,METAL	15K OHM 1/4W
△R406	72797904	R3X28A391J	R,METAL OXIDE	390 OHM 2W
△R412	75006472	R65581330J	R,FUSE	33 OHM 1W
△R417	72796443	R3X28A221J	R,METAL OXIDE	220 OHM 2W
△R423	72795512	R3X18AR56J	R,METAL OXIDE	0.56 OHM 2W
△R429	72794597	R002T22R2J	RC	2.2 OHM 1/2W
△R430	72797991	R5X34F2R7J	R,CEMENT	2.7 OHM 10W
△R434	72797785	R002T21R5J	RC	1.5 OHM 1/2W
△R435	72794614	R65582010J	R,FUSE	1 OHM 1/2W
△R436	72783954	R3K581101J	R,METAL OXIDE	100 OHM 1W
△R440	72797992	R5X34F332J	R,CEMENT	3.3K OHM 10W
△R445	72798036	R6558A1R8J	R,FUSE	1.8 OHM 2W
△R454	72794608	R3K581102J	R,METAL OXIDE	1K OHM 1W
△R639	72797846	R3X181270J	R,METAL OXIDE	27 OHM 1W
△R803	72783957	R3K18A153J	R,METAL	15K OHM 2W
△R805	72783957	R3K18A153J	R,METAL	15K OHM 2W
△R807	72783957	R3K18A153J	R,METAL	15K OHM 2W
△R1701	72795500	R002T2155J	RC	1.5M OHM 1/2W
△R1702	72794631	R0G3K2275K	RC	2.7M OHM 1/2W
△R1706	72794658	R002T4272J	RC	2.7K OHM 1/4W
△R1714	72795513	R3X181R15J	R,METAL OXIDE	0.15 OHM 1W
△R1717	72795503	R3X28A331J	R,METAL OXIDE	330 OHM 2W
△R1718	72796434	R5X2CE1R2J	R,CEMENT	1.2 OHM 7W
△R1720	72794633	R63881R22J	R,FUSE	0.22 OHM 1W
△R3021	75006220	R3K581330J	R,METAL OXIDE	33 OHM 1W
△R3601	72797917	R3X28B1R5J	R,METAL OXIDE	1.5 OHM 3W
△R8007	72797917	R3X28B1R5J	R,METAL OXIDE	1.5 OHM 3W
CAPACITORS				
C353	75006221	E7EP03102M	CE	1000 UF 25V
C354	75006222	E7EP03222M	CE	2200 UF 25V
C359	75006222	E7EP03222M	CE	2200 UF 25V
△C403	75006552	E7EPU8220M	CE	22 UF 100V
C404	72781391	E61DFB470M	CE	47 UF 160V
△C408	72783562	P4N8FK472H	CMPP	0.0047UF 1.5KV
△C409	75007351	E7EPU4101M	CE	100 UF 35V
C412	72795104	P4J7F3474J	CMPP	0.47 UF 250V PMS
△C417	72797680	P3N1F5273J	CPP	0.027 UF 630V
△C418	72797720	P4N8FK153H	CMPP	0.015 UF 1.5KV
△C429	75007351	E7EPU4101M	CE	100 UF 35V
△C430	75006224	E7ESF3222M	CE	2200 UF 25V
△C434	75006225	E7ES04102M	CE	1000 UF 35V
C435	75006226	E8EBFD100M	CE	10 UF 250V
△C446	75006227	E7ESFD220M	CE	22 UF 250V
C449	72794393	C03L0R713K	CC	0.001 UF 2KV R
C802	72795578	C0JBB0713K	CC	0.001 UF 2KV B
△C1701	72794401	P2122B334M	CMP	0.33 UF 275V ECQUL
C1707	72795630	C03L0R7U2K	CC	680 PF 2KV R
△C1708	72794440	C0JBB07H3K	CC	0.0022UF 2KV B
△C1710	72794440	C0JBB07H3K	CC	0.0022UF 2KV B
△C1711	72795579	CD39E0MQ3M	CC	0.0047UF 250V
△C1714	75006228	E7EWHC681M	CE	680 UF 200V
△C1716	75006222	E7EP03222M	CE	2200 UF 25V
△C1717	75006229	E7ESF4102M	CE	1000 UF 35V
C1719	72794393	C03L0R713K	CC	0.001 UF 2KV R
△C1720	72796328	E61SFC221M	CE	220 UF 200V
△C1728	75006224	E7ESF3222M	CE	2200 UF 25V
△C1732	75006230	E7ESF3102M	CE	1000 UF 25V
△C1733	75007352	E7EPU5220M	CE	22 UF 50V
C3609	75006231	E7ES01222M	CE	2200 UF 10V
C3612	75006231	E7ES01222M	CE	2200 UF 10V
DIODES				
D401	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
△D402	72794472	D2WTAU02A0	DIODE SILICON	AU02A-EIC
D403	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D404	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
△D405	72797302	D2BFRS4FS0	DIODE,SILICON	RS-4FS
△D406	72796383	D2BFRU4AM0	DIODE,SILICON	RU-4AM
△D407	72794472	D2WTAU02A0	DIODE SILICON	AU02A-EIC
△D408	72794489	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D410	72794488	D2WT011E10	DIODE SILICON	11E1-EIC
D411	72794489	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
△D412	72794472	D2WTAU02A0	DIODE SILICON	AU02A-EIC
D413	72794471	D97U03001B	DIODE,ZENER	MTZJ30B T-77

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
			DIODES	
D414	72794471	D97U03001B	DIODE,ZENER	MTZJ30B T-77
△D415	72794472	D2WTAU02A0	DIODE SILICON	AU02A-EIC
D416	72795626	D2WXN40050	DIODE SILICON	1N4005-EIC
D417	72794478	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D418	72794465	D97U03301B	DIODE,ZENER	MTZJ33B T-77
D419	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D420	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D601	72794487	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D602	72794487	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D603	72794487	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D604	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D605	72794487	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D607	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D801	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D802	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D803	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D810	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D811	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D812	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D1001	72795889	0010E00330	INFRARED LED	LTE-3271T-012A-O
D1002	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D1003	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D1004	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D1005	75002834	DD7PN202U0	DIODE SILICON	DAN202UT106
D1006	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D1014	72794477	D97U01501B	DIODE,ZENER	MTZJ15B T-77
D1702	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D1703	72797331	D97U02R71B	DIODE,ZENER	MTZJ2.7B T-77
△D1704	72783905	D2LXFR1550	DIODE SILICON	FR155-F
△D1705	72794473	D2WTRM11C0	DIODE SILICON	RM11C-EIC
△D1706	72794473	D2WTRM11C0	DIODE SILICON	RM11C-EIC
△D1707	72783905	D2LXFR1550	DIODE SILICON	FR155-F
D1709	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
△D1710	72794473	D2WTRM11C0	DIODE SILICON	RM11C-EIC
△D1711	72794473	D2WTRM11C0	DIODE SILICON	RM11C-EIC
D1712	72794468	D97U02R21B	DIODE,ZENER	MTZJ2.2B T-77
△D1713	72781353	D27A85T400	DIODE SCHOTTKY	RB085T-40
D1715	72795541	D97U01801B	DIODE,ZENER	MTZJ18B T-77
D1716	72794483	D2WXN49370	DIODE SILICON	1N4937
D1717	72795541	D97U01801B	DIODE,ZENER	MTZJ18B T-77
△D1718	72794483	D2WXN49370	DIODE SILICON	1N4937
△D1719	72781352	D23A0010J0	DIODE SCHOTTKY	SBR100-10J-CBC11
D1720	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D1721	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
△D1722	72794483	D2WXN49370	DIODE SILICON	1N4937
△D1723	72796383	D2BFRU4AM0	DIODE,SILICON	RU-4AM
D1724	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D1726	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
△D1727	72795544	D6E027110A	DIODE VARISTA	ENE271D-10A
D1728	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
△D1730	72795894	D28F31DQ09	DIODE SCHOTTKY	31DQ09-FC
D1732	72795541	D97U01801B	DIODE,ZENER	MTZJ18B T-77
△D1734	72795544	D6E027110A	DIODE VARISTA	ENE271D-10A
D1735	72794491	D1VT001330	DIODE,SILICON	1SS133T-77
D1736	72795893	D97U04R31B	DIODE,ZENER	MTZJ4.3B T-77
△D1737	75004393	DOU013020M	DIODE VARISTA	DA38-302MB-M
D2201	72794478	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D2202	72794478	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D2205	72796482	0021E2Q140	LED	LTL-1CHEE-002A
D2206	72796482	0021E2Q140	LED	LTL-1CHEE-002A
D2207	72796482	0021E2Q140	LED	LTL-1CHEE-002A
D2303	72795897	DD7R0S3550	DIODE SILICON	1SS355 TE-17
D2304	72795897	DD7R0S3550	DIODE SILICON	1SS355 TE-17
D3001	72794465	D97U03301B	DIODE,ZENER	MTZJ33B T-77
D3002	72794489	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D3003	72794488	D2WT011E10	DIODE SILICON	11E1-EIC
D3004	72795627	D2WXS1400	DIODE SCHOTTKY	SB140-EIC
D3005	72795087	D28TEQS040	DIODE,SCHOTTKY	11EQS04TA1B2
D3006	72794488	D2WT011E10	DIODE SILICON	11E1-EIC
D3007	72794488	D2WT011E10	DIODE SILICON	11E1-EIC
D3008	72783906	D2LXSR2900	DIODE SCHOTTKY	SR290-F
D3009	72796083	D97U01001B	DIODE,ZENER	MTZJ10B T-77
D3010	72795626	D2WXN40050	DIODE SILICON	1N4005-EIC
D3601	72795626	D2WXN40050	DIODE SILICON	1N4005-EIC
D3602	75006232	D4CRSK34A0	DIODE SCHOTTKY	SK34A

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
DIODES				
D4003	72795897	DD7R0S3550	DIODE SILICON	1SS355 TE-17
D4004	72795897	DD7R0S3550	DIODE SILICON	1SS355 TE-17
D4005	72795897	DD7R0S3550	DIODE SILICON	1SS355 TE-17
D4006	72795897	DD7R0S3550	DIODE SILICON	1SS355 TE-17
D4007	72795897	DD7R0S3550	DIODE SILICON	1SS355 TE-17
D4201	72794489	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D8111	72795897	DD7R0S3550	DIODE SILICON	1SS355 TE-17
D8112	72795897	DD7R0S3550	DIODE SILICON	1SS355 TE-17
ICS				
IC301	72783378	I5AFF11730	IC	NJW1173V(TE1)
△IC351	72794497	I0FSP7808B	IC	AN17808B
△IC401	72794507	I03TD80410	IC	LA78041
IC601	75006233	I03FC6327B	IC	LA76327M-B-MPB-E
IC702	72797567	I0QF025840	IC	NJM2584AM(TE1)
IC1001	75006234	I56F57175A	IC	OEC7175A
△IC1003	72796084	I9UF032310	IC	PST3231NR
IC1099	75006473	S5Y501FE01	MEMORY DATA	AT24C08AN-10SU-2.7
△IC1701	72794512	000220002W	PHOTO COUPLER	PS2561AL1-1-V(W)
△IC1702	72794508	I1KJ9A431A	IC	KIA431A-AT
△IC2301	72783216	I03FV65650	IC	LA6565VR-TLM-E
IC2401	75006236	ICQK039740	IC	ZR39740HGCF-B0
IC2402	72783776	ICLJ022ET5	IC	HY5DU561622ETP-D43
IC2403	75006237	ICRJ004SU0	IC	AT24C04N-10SU-2.7
IC2405	75006238	S5Y401HF02	MEMORY DATA	EN25P16-50HCP
IC2406	72783377	I1FF043450	IC	CS4345-CZZ
△IC3001	72795906	I1KA78R050	IC	KIA278R05PI
△IC3003	72795906	I1KA78R050	IC	KIA278R05PI
△IC3005	72797594	I1KA98R06A	IC	KIA78R06API
△IC3601	72781440	I07F0C0WF0	IC	BA00BC0WFP-E2
△IC3602	72781440	I07F0C0WF0	IC	BA00BC0WFP-E2
△IC3603	72783917	I03T057740	IC	LA5774-E
IC4001	75003921	ICQK068821	IC	ZR36882ELCG
△IC4003	72795912	I07F9E00W0	IC	BA33E00WHFP-TR
IC4007	75006240	S5Y401HF01	MEMORY DATA	SST39VF1601-70-4C-EKE
IC4008	72783786	IF9J0164AG	IC	M12L64164A-TTG
IC4201	72794501	I01F05853B	IC	AN15853B-E1
IC4501	72795916	I03F3206ME	IC	LA71206M-MPB-E
IC5501	72797540	I03F670BM0	IC	LA72670BM-L-MPB-E
IC8004	72795921	I0QJ045800	IC	NJM4580M(TE1)
IC8006	72783788	I5CF040520	IC	SN74LV4052APW
IC8102	72795922	I17F017530	IC	PCM1753DBQR
TRANSISTORS				
Q001	72794566	TAAA1504SY	TRANSISTOR SILICON	KTA1504S_Y_RTK
Q004	72783825	T2AA5132E0	FET	KTK5132E-RTK/P
Q005	72794560	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S
Q010	72783825	T2AA5132E0	FET	KTK5132E-RTK/P
△Q401	72794561	TCAT03227Y	TRANSISTOR SILICON	KTC3227_Y-AT
Q402	72794563	TC30041590	TRANSISTOR,SILICON	2SC4159(D,E)
△Q403	75006241	TD50027110	TRANSISTOR SILICON	2SD2711
Q404	72794578	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)
Q405	72794578	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)
△Q406	72794569	TA3T016240	TRANSISTOR,SILICON	2SA1624-AA
△Q407	72798355	TNATB03005	COMPOUND TRANSISTOR	KRC102MAT
Q408	72794565	TCAT032070	TRANSISTOR SILICON	KTC3207-AT
Q409	72794569	TA3T016240	TRANSISTOR,SILICON	2SA1624-AA
Q410	72794577	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q601	72795962	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK
Q602	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
Q603	72798324	TAAT012714	TRANSISTOR, SILICON	KTA1271_Y-AT
Q605	72795963	TPAAB05001	COMPOUND TRANSISTOR	KRA102SRTK
Q606	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
△Q801	72794573	TCATC3199Y	TRANSISTOR SILICON	KTC3199_Y-AT
△Q802	72794573	TCATC3199Y	TRANSISTOR SILICON	KTC3199_Y-AT
△Q803	72794573	TCATC3199Y	TRANSISTOR SILICON	KTC3199_Y-AT
△Q804	72794574	TCA0042170	TRANSISTOR SILICON	KTC4217(O,Y)
△Q805	72794574	TCA0042170	TRANSISTOR SILICON	KTC4217(O,Y)
△Q806	72794574	TCA0042170	TRANSISTOR SILICON	KTC4217(O,Y)
△Q1001	72796091	0002700690	PHOTO COUPLER	RPI-303
Q1002	72794566	TAAA1504SY	TRANSISTOR SILICON	KTA1504S_Y_RTK
Q1003	72796090	0002700680	PHOTO COUPLER	RPI-352C40N
Q1004	72794567	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q1005	72796091	0002700690	PHOTO COUPLER	RPI-303
Q1006	72798367	TPAAC05002	COMPOUND TRANSISTOR	KRA103SRTK
Q1007	72794567	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q1009	72796090	0002700680	PHOTO COUPLER	RPI-352C40N

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
TRANSISTORS				
Q1011	72795960	0000M00390	PHOTO TRANSISTOR	ST-304L
Q1013	72795960	0000M00390	PHOTO TRANSISTOR	ST-304L
Q1024	72794567	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q1508	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
Q1702	72794577	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
ΔQ1705	72783392	TJXG10NK50	FET	STF10NK50Z
ΔQ1706	72795476	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT
Q2201	72795962	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK
Q2202	72795962	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK
Q2203	72795962	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK
Q2301	72783823	TAAA1505SY	TRANSISTOR SILICON	KTA1505S-Y-RTK/P
Q2302	72783824	TAAA1544T0	TRANSISTOR SILICON	KTA1544T-RTK/P
Q2303	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
Q2304	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
Q2305	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
Q3001	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
ΔQ3003	72794570	TCAT03209Y	TRANSISTOR SILICON	KTC3209_Y-AT
Q3004	72794570	TCAT03209Y	TRANSISTOR SILICON	KTC3209_Y-AT
ΔQ3007	72796092	TAAT01281Y	TRANSISTOR SILICON	KTA1281_Y
Q3010	72794570	TCAT03209Y	TRANSISTOR SILICON	KTC3209_Y-AT
Q3011	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
ΔQ3014	72794570	TCAT03209Y	TRANSISTOR SILICON	KTC3209_Y-AT
Q4006	72798315	T27T030180	FET	2SK3018T106
Q4201	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
Q4202	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
Q4203	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
Q4501	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
Q4502	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
Q4503	72798367	TPAAC05002	COMPOUND TRANSISTOR	KRA103SRTK
Q4504	72795476	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT
Q4505	72794578	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)
Q4506	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
Q4507	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
Q4509	72794566	TAAA1504SY	TRANSISTOR SILICON	KTA1504S_Y_RTK
Q4511	72794566	TAAA1504SY	TRANSISTOR SILICON	KTA1504S_Y_RTK
Q8001	72795962	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK
ΔQ8002	72796092	TAAT01281Y	TRANSISTOR SILICON	KTA1281_Y
Q8051	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
Q8052	72794571	TCAA3875SY	TRANSISTOR SILICON	KTC3875S_Y_RTK
Q8053	72798366	TPAAA05001	COMPOUND TRANSISTOR	KRA101SRTK
Q8054	72794567	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q8055	72794558	TNAAD05001	COMPOUND TRANSISTOR	KRC104SRTK
COILS & TRANSFORMERS				
L001	75006242	021LXM220K	COIL	22 UH
L002	72796087	02167E100K	COIL	10 UH
L004	72796407	02167D101K	COIL	100 UH
L301	75006243	021L7L220J	COIL	22 UH
L353	72796645	02AHB0A0A4	CORE FERRITE	W5T_20X10X10A
L401	72782568	02D3000057	COIL CHOKE	ELC18B501LN
L402	72783670	022K00044A	COIL,LINEARITY	311015001
L403	72795560	021L75472J	COIL	4.7 MH
L601	75006244	021LXM101J	COIL	100 UH
L602	72796407	02167D101K	COIL	100 UH
L603	72796088	02AHB9A972	CORE,FERRITE	W5T29X7.5X19
L702	75006245	021LXM470K	COIL	47 UH
L1001	72796575	021LA62R2M	COIL	2.2 UH
L1511	75006245	021LXM470K	COIL	47 UH
ΔL1701	72798944	029X000122	COIL,LINE FILTER	SS28V-R22110-CH
ΔL1703	72783671	028T250021	COIL,DEGAUSS	T028R25021
L1704	72796645	02AHB0A0A4	CORE FERRITE	W5T_20X10X10A
L2401	72783383	021AS9224J	COIL	0.22 UH
L2420	72783384	0216SDR47J	COIL	0.47 UH
L2421	72783384	0216SDR47J	COIL	0.47 UH
L2422	72783384	0216SDR47J	COIL	0.47 UH
L2423	72783384	0216SDR47J	COIL	0.47 UH
L3601	72796513	02167E220K	COIL	22 UH
L3602	75006247	02130G330M	COIL	33 UH
L4001	75006248	02167B2R2J	COIL	2.2 UH
L4002	72796088	02AHB9A972	CORE,FERRITE	W5T29X7.5X19
L4204	75006249	021L7L101J	COIL	100 UH
L4501	72796407	02167D101K	COIL	100 UH
L4502	72796657	031626010R	COIL,BIAS OSC	1626010
L4503	72796407	02167D101K	COIL	100 UH
L4504	75006354	02167B101J	COIL	100 UH
L4505	75006245	021LXM470K	COIL	47 UH

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
COILS & TRANSFORMERS				
L4506	75006245	021LXM470K	COIL	47 UH
L4509	72796407	02167D101K	COIL	100 UH
L4510	72794524	021LA6100J	COIL	10 UH
L5501	75006243	021L7L220J	COIL	22 UH
L5502	72796571	021LA6220J	COIL	22 UH
L5503	75006243	021L7L220J	COIL	22 UH
L5504	75006243	021L7L220J	COIL	22 UH
L5505	75006243	021L7L220J	COIL	22 UH
L8102	75006250	02167B1R0J	COIL	1 UH
L8103	75006250	02167B1R0J	COIL	1 UH
L8104	75006250	02167B1R0J	COIL	1 UH
T401	72794690	0450190171	TRANS,HORIZONTAL DRIVE	ETH19Y206AY
△T1701	75006403	0481420864	TRANSFORMER,SWITCHING	81420864
JACKS				
△J801	75004681	066F130026	SOCKET,CATHODE RAY TUBE	ISHD62S
△J2201	72794516	060J131016	HEADPHONE JACK	MSJ-2000_AG
J2202	75006251	060R421064	RCA JACK	RCA-102S(CUSN)(YL)
J2203	75006252	060R421062	RCA JACK	RCA-102S(CUSN)(WH)
J2204	75006253	060R421063	RCA JACK	RCA-102S(CUSN)(RD)
J4201	72794518	060J431020	RCA JACK	MSP-213V2-432_NI_LF
J4202	72795493	060J411032	RCA JACK	MSP-213V1-652_NI_LF
J4203	75006254	063E700018	JACK	S4-18SV1H
J4204	72798996	060J431022	RCA JACK	MSP-213V2-732_NI_LF
SWITCHES				
SW1001	72796051	0508S11001	SWITCH (LEAF)	LSA-1144EAU
SW2201	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2202	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2203	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2204	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2205	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2206	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2207	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2251	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2252	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2253	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2254	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2255	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2256	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2257	72794688	0504101T34	SWITCH,TACT	EVQ21505R
SW2258	72794688	0504101T34	SWITCH,TACT	EVQ21505R
VARIABLE RESISTORS				
VR404	72795471	V1K63H3BTE	VOLUME,SEMI FIXED	NVG6TLTAB222
VR1701	72798392	V1K6314BTE	VOLUME,SEMI FIXED	NVG6TLTAB103
P.C.BOARD ASSEMBLIES				
PCB010	75006474	A5Y501F010	VCR MT PCB ASS'Y	DMF086A
PCB080	75006475	A5Y501F080	DEFLECTION PCB ASS'Y	CMF079B
PCB110	75006476	A5Y501F110	CRT PCB ASS'Y	CCF072B
PCB130	75006477	A5Y501F130	DVD MT PCB ASS'Y	DME064A
PCB270	75006478	A5Y501F270	OPERATION PCB ASS'Y	CEF167B
PCBDH0	75006479	A5Y501FDH0	DIGITAL PCB ASS'Y	CEF242A
MISCELLANEOUS				
B001	72783356	024HC51023	CORE,BEADS	FCM1608KF-102T02
B002	72783356	024HC51023	CORE,BEADS	FCM1608KF-102T02
B003	72783356	024HC51023	CORE,BEADS	FCM1608KF-102T02
B004	72783356	024HC51023	CORE,BEADS	FCM1608KF-102T02
B006	72783357	024HC51513	CORE,BEADS	FCM1608KF-151T06
B403	72794357	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B1706	72794357	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B2301	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B2302	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B2304	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B2305	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B2401	72783357	024HC51513	CORE,BEADS	FCM1608KF-151T06
B2402	72783357	024HC51513	CORE,BEADS	FCM1608KF-151T06
B2403	72783357	024HC51513	CORE,BEADS	FCM1608KF-151T06
B2404	72783357	024HC51513	CORE,BEADS	FCM1608KF-151T06
B2405	72783357	024HC51513	CORE,BEADS	FCM1608KF-151T06
B2406	72783356	024HC51023	CORE,BEADS	FCM1608KF-102T02
B2407	72783356	024HC51023	CORE,BEADS	FCM1608KF-102T02
B2408	72783356	024HC51023	CORE,BEADS	FCM1608KF-102T02
B2409	72783356	024HC51023	CORE,BEADS	FCM1608KF-102T02
B2410	72783356	024HC51023	CORE,BEADS	FCM1608KF-102T02
B2415	72783356	024HC51023	CORE,BEADS	FCM1608KF-102T02
B2416	72783356	024HC51023	CORE,BEADS	FCM1608KF-102T02
B2417	72783358	024HC16014	CORE,BEADS	HCB3216KF-601T20

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
			MISCELLANEOUS	
B2418	75006262	024HC13014	CORE,BEADS	HCB3216KF-301T25
B2419	72783358	024HC16014	CORE,BEADS	HCB3216KF-601T20
B2421	72783356	024HC51023	CORE,BEADS	FCM1608KF-102T02
B4001	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4002	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4003	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4004	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4005	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4006	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4007	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4008	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4009	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4010	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4011	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4012	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4013	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4014	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4015	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4016	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4017	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4018	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
B4201	72794355	024HT03563	CORE,BEADS	W4BRH3.5X6X1.0X2
B8103	75006261	024NC51021	CORE,BEADS	EBMS160808A102_RDC45
BT001	72783174	141U004016	BATTERY,MANGAN	MNAAA(R03)
BT002	72783174	141U004016	BATTERY,MANGAN	MNAAA(R03)
CD001	72783892	WAL6820038	FLAT CABLE AWM2468	AWG26 3C GRAY 200MM
CD002	75006529	122E521501	CORD JUMPER	2E521501
CD301	75006263	06CU2A2502	CORD CONNECTOR	CU2A2502
CD351	75006264	06CH149010	CORD CONNECTOR	CH149010
CD353	72782834	06CH149006	CORD CONNECTOR	CH149006
CD602	72796896	06CU291701	CORD CONNECTOR	CU291701
CD603	75006410	06CU284502	CORD CONNECTOR	CU284502
CD604	72796893	06CU282401	CORD CONNECTOR	CU282401
CD802	72796887	06CU253901	CORD CONNECTOR	CU253901
CD803	72794460	06CH823004	CORD CONNECTOR	CH823004
CD806	72796850	06CH014302	CORD EIS CONNECTOR	CH014302
CD807	72799108	06CH012801	CORD EIS CONNECTOR	CH012801
CD808	72799105	06CH011202	CORD EIS CONNECTOR	CH011202
CD852	72796871	06CU012501	CORD CONNECTOR	CU012501
CP001	72796825	069W01001A	CONNECTOR PCB SIDE	003P-2100
CP003	72796749	067U003029	WIRE HOLDER	B2013H02-3P
CP004	72796749	067U003029	WIRE HOLDER	B2013H02-3P
CP301	72796806	069S2A0629	CONNECTOR PCB SIDE	A2001VW2-10P
CP351	72796793	069S140419	CONNECTOR PCB SIDE	A2502VW2-4P
CP353	72796793	069S140419	CONNECTOR PCB SIDE	A2502VW2-4P
△CP404	72795550	069S460089	CORD UX CONNECTOR	A1561VW2-A6P
CP601	72796797	069S240639	CONNECTOR PCB SIDE	A2001WR2-4P
CP602	72796755	067U009039	WIRE HOLDER	B2013H02-9P
CP603	72796798	069S250629	CONNECTOR PCB SIDE	A2001VW2-5P
CP604	72796803	069S280629	CONNECTOR PCB SIDE	A2001VW2-8P
CP803	72796816	069S320010	CONNECTOR PCB SIDE	A2361VW2-2P
CP806	72796824	069W010010	CONNECTOR PCB SIDE	005P-2100
△CD1702	75006266	1207415920	CORD AC BUSH	7415920
CD1705	72799106	06CH012403	CORD EIS CONNECTOR	CH012403
CD2251	72783893	06CU220707	CORD CONNECTOR	CU220707
CD4002	72796905	06CU2D3201	CORD CONNECTOR	CU2D3201
CD4501	72795877	122F061502	CORD JUMPER	2F061502
CD4503	72795878	W9L6012042	FLAT CABLE AWM2468	AWG26 2C BLACK 120MM
CD8101	72799262	122H0C1302	CORD JUMPER	2H0C1302
CP1001	72796765	06972C0010	CONNECTOR PCB SIDE	TMC-J12P-B2
CP1701	72796768	069D01001A	CONNECTOR PCB SIDE	003P-2100
CP1702	72796754	067U008029	WIRE HOLDER	B2013H02-8P
CP1703	72796768	069D01001A	CONNECTOR PCB SIDE	003P-2100
△CP1704	72796821	069S420110	CONNECTOR PCB SIDE	A1561VW2-2P
CP1707	72796768	069D01001A	CONNECTOR PCB SIDE	003P-2100
CP1708	72796768	069D01001A	CONNECTOR PCB SIDE	003P-2100
CP2201	72796080	069S220629	CONNECTOR PCB SIDE	A2001VW2-2P
CP2301	72783177	069KYOT159	CONNECTOR PCB SIDE	LD07T2-24ND-03
CP2302	72799012	069EV53030	CONNECTOR PCB SIDE	00_6232_005_006_800+
CP2303	72799013	069EV63030	CONNECTOR PCB SIDE	00_6232_006_006_800+
CP2403	75006267	069J2S004A	CONNECTOR PCB SIDE	IMSA-6029B-1-28Z136-
CP2420	72796805	069S290639	CONNECTOR PCB SIDE	A2001WR2-9P
CP4501	72796477	0697290620	CONNECTOR PCB SIDE	TOC-C09X-A1
CP4502	72796773	069J760599	CONNECTOR PCB SIDE	IMSA-9604S-06C
CP4503	72796748	067U002019	WIRE HOLDER	B2013H02-2P

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
MISCELLANEOUS				
CP602B	72796804	069S290629	CONNECTOR PCB SIDE	A2001WV2-9P
CP8001	72796810	069S2D0629	CONNECTOR PCB SIDE	A2001WV2-13P
CP8002	72796776	069J7C0599	CONNECTOR PCB SIDE	IMSA-9604S-12C
CP801B	72796798	069S250629	CONNECTOR PCB SIDE	A2001WV2-5P
CP802A	72796751	067U005049	WIRE HOLDER	B2013H02-5P
CP802B	72796803	069S280629	CONNECTOR PCB SIDE	A2001WV2-8P
CP8101	72799040	069J7C0589	CONNECTOR PCB SIDE	IMSA-9604S-12F
CUS011	72795888	800WFAA008	CUSHION C	
EL0101	72797069	124116281A	EYE LET	XRY16X28BD
EL0102	72797070	124120301A	EYE LET	XRY20X30BD
EL0801	72797069	124116281A	EYE LET	XRY16X28BD
EL0802	72797070	124120301A	EYE LET	XRY20X30BD
△F1701	72794493	081PC6R305	FUSE	51MS063L
△FB401	72796671	043224007F	TRANSFORMER,FLYBACK	
FH1701	72794496	06710T0009	HOLDER,FUSE	EYF-52BCY
FH1702	72794496	06710T0009	HOLDER,FUSE	EYF-52BCY
NR2401	75006268	110P4150M5	R,NETWORK	4D02WGJ0150TCE
NR2402	75006268	110P4150M5	R,NETWORK	4D02WGJ0150TCE
NR2403	75006268	110P4150M5	R,NETWORK	4D02WGJ0150TCE
NR2404	75006268	110P4150M5	R,NETWORK	4D02WGJ0150TCE
NR2405	75006268	110P4150M5	R,NETWORK	4D02WGJ0150TCE
NR2406	75006268	110P4150M5	R,NETWORK	4D02WGJ0150TCE
NR2407	75006268	110P4150M5	R,NETWORK	4D02WGJ0150TCE
NR2408	75007437	110P4470M5	R,NETWORK	4D02WGJ0470TCE
NR2409	75006268	110P4150M5	R,NETWORK	4D02WGJ0150TCE
OS2201	72783677	077A031003	REMOTE RECEIVER	ROM-V3138SR
△RY1701	72798987	0560V20119	RELAY	
△SP351	72799166	070N546012	SPEAKER	YDP4010-2
△SP352	72799166	070N546012	SPEAKER	YDP4010-2
TM101	75006269	076D0KH080	TRANSMITTER	000-103000400
△TU001	75006270	0164100022	DIGITAL TUNER	ENG36E03KF
△TH1701	72795546	DF5EL3R0A0	DEGAUSS ELEMENT	ZPB45BL3R0A
△V801	72783422	098W250404	CRT W/DY	A60MAU095X80
X601	75006272	100GT3R543	CRYSTAL	B03579H006
X1001	75006273	100GT01215	CRYSTAL	B12000E011
X1002	72796062	100DA32R01	CRYSTAL	DT-26
X2401	72783400	100GA02502	CRYSTAL	B25000H006
X4001	72783182	100GT02720	CRYSTAL	B27000C005
X4501	72796064	100CT3R502	CRYSTAL	HC-49/U

RESISTOR

RC.....CARBON RESISTOR

CAPACITORS

CC.....CERAMIC CAPACITOR
CE.....ALUMI ELECTROLYTIC CAPACITOR
CP.....POLYESTER CAPACITOR
CPP.....POLYPROPYLENE CAPACITOR
CPL.....PLASTIC CAPACITOR
CMP.....METAL POLYESTER CAPACITOR
CMPL.....METAL PLASTIC CAPACITOR
CMPP.....METAL POLYPROPYLENE CAPACITOR

TOSHIBA CORPORATION

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN